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CONTENTS

PAGE

Portrait of Johann Peter Frank . . . . Cover

Portrait of William Heberden the Younger . . . . . Frontispiece

William Anderson, 1748–1778 . . J. J. Keevil 511

Johann Peter Frank and His "System einer vollständigen medicinischen Polizey" (Part I) . Leona Baumgartner and Elizabeth Mapelsden Ramsey 525

History of Influenza Epidemics . John F. Townsend 533

Graefenberg, the Shepard Family's Medical School . . . . . Roy H. Turner 548

The Intolerance of Great Men . David B. Radner 561

The Two Heberdens (Part II, Conclusion) . . . . Sir Humphry Rolleston . . 566

An Introduction to the History of Women in Medicine (Conclusion) . . . . Kate Campbell Hurd-Mead . 584

Editorial 601

Larrey and Mediate Auscultation. . . . . George Dock

Book Reviews 603

Monro: The Physician as Man of Letters, Science and Action; Sigerist: The Great Doctors; Opuscula Selecta Neerlandicorum de Arte Medica, Vols. IX, X and XI.

Index. 607

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Frontispiece
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November, 1933

William Heberden the Younger
[1767–1854]

[From Schenckius: Observationum Medicarum, Francofurti, 1609.]

ANNALS OF MEDICAL HISTORY

New Series, Volume V November, 1933 Number 6

WILLIAM ANDERSON, 1748–1778

MASTER SURGEON, ROYAL NAVY

By J. J. KEEVIL, M.B., SURG. LIEUT., R.N.

LONDON, ENGLAND

THE true measure of William Anderson is realized when it is remembered that he lived only about thirty years and that all his contributions to knowledge were made in the last eight years of his life. His achievements have not been adequately recognized.

The Gun-room port closed, H.M. Sloop *Resolution* continued her slow passage to the North after her first funeral at sea, the purser made his laconic entry in the pay book "Discharged Dead," and, in the evening, Captain Cook in the solitude of the Great Cabin wrote up his journal. "Tuesday, the 4th. of August, 1778 . . . soon after he had breathed his last, land was seen to the Westward; and to perpetuate the memory of the deceased, for whom I had a very great regard, I named it Anderson's Island. . . . " (Appendix 1)

William Anderson's brief career had ended. But the young man, who two years previously had stepped into Richmond Blamire's shop at the corner of Craven Street, Strand, and bought three note books, had left nine hundred pages of manuscript,[7] which, apart from his other writings, were to make his name remembered. In these vellum-backed volumes he recorded with great care the daily progress of Cook's last voyage as it appeared to a man of wide learning and interests who was impelled by a consuming thirst for knowledge.

William Anderson was born in Scotland about 1748,[20] the year James Lind retired from service afloat. Of his early life nothing is known. His youth covers a period of wars and upheavals; by the time he was eight years old the Seven Years War had broken out, India was in a ferment, and the news of the Black Hole atrocities had reached England. The loss of Minorca, the shooting of Admiral Byng, and the successes of Boscawen followed. Before the Peace of Paris the activities of the Navy were repeatedly before the public. When Anderson was twenty-three interest in travel and discovery had been stimulated by the return of Lieutenant James Cook from the first of his three great voyages. Meanwhile there had been an awakening interest in naval medicine. The disastrous inroads of scurvy during Lord Anson's voyage of 1740 had prompted Lind to write his famous Treatise in 1754, while his book on tropical medicine appeared in 1768. Stephen Hales had published his pioneer work on naval hygiene in 1743, "Description of Ventilation," which was followed in 1745 by Samuel Sutton's book on the same subject. Like other young Scottish doctors at that time Anderson may have become interested in travel by starting life as surgeon to the Greenland Fisheries Company or in some ship engaged in the slave trade. A knowledge he showed of the ancient Mexican language and of diseases in the West Indies supports the latter suggestion. His marked botanical inclinations suggest that he may at some time have been a student at the Botanic Gardens in Edinburgh. This is made the more probable by a note he made later when he named a new genus, "I called it Ramsaia in honour of Dr. Ramsay, Professor of Natural History in the University of Edinburgh."[9] Unfortunately the records of the Royal College of Physicians and the Incorporation of Surgeons of Edinburgh, of the University and of the Faculty of Physicians and Surgeons of Glasgow, show no evidence of his medical studentship or apprenticeship. Similarly no information about him can be found in the defective nineteenth century transcript, "The Surgeon's Servitude Record," at the Public Record Office.[23]

William Anderson's name first appears in the public records in the Muster and Pay Books of H. M. Sloop *Resolution* as Surgeon's first Mate on the 3rd of December, 1771. He entered by Warrant from the Navy Board. The ship in which Anderson began his naval career was a surveying sloop of 462 tons under the command of Lieutenant James Cook; James Patten was the surgeon. Of the remaining seven years of his life six were spent almost continuously afloat under conditions of great hardship and privation. This was the ship of which Lieutenant Charles Clerke wrote to Sir Joseph Banks[21] as " . . . by far the most unsafe ship I ever saw or heard of . . . a ship which a pilot will not undertake to carry down the river," while Banks stated that she had a " . . . low and small cabin and was remarkably low between decks."[21] The *Resolution* had as her consort on this voyage the *Adventure*, a sloop of 336 tons, Captain Tobïas Furneaux, Surgeon Thomas Andrews. The *Resolution* sailed from Deptford on April 9, 1772, but contrary winds prevented her from leaving English shores until the thirteenth of July. The voyage was undertaken for purposes of surveying and for collecting material of general scientific interest. Calling first at Ascension they sailed thence to the Cape of Good Hope. They next followed a route along the edge of the Antarctic ice, creeping through ice fields hidden by sleet, or moving slowly with half frozen crews through fog banks, till they reached latitude 71° South. Water was scarce and the ships' provisions were beginning to deteriorate. After 117 days out of sight of land they reached New Zealand and in the following summer visited the Society and Friendly Islands. A considerable outbreak of scurvy threatened, but was averted. There had already been 20 cases in the *Adventure* with one death, though there were none in the *Resolution*. Cook had prevented any serious menace to his ship's company of 118 men by supplementing their food with cabbage, sweetwort, sauerkraut, marmalade of carrot, "which the surgeon found useful in several cases,"[11] malt, mustard, and portable broth, as well as rob of lemons and oranges . . . a measure which was to bring him the Copley Medal of the Royal Society. On his voyage of 1768–1771 in the *Endeavour* Cook had lost thirty men, including the surgeon, Monkhouse, out of a ship's company of eighty-five; these deaths are said, however, to have been due chiefly to malaria contracted at Batavia.[21] After his second voyage he was able to write,[11] "*The Resolution* performed a voyage of three years and eighteen days, through all climates from 52° North to 71° South, with the loss of one man only by disease, and who died of a complicated and lingering illness, without any mixture of scurvy" (Appendix 5). In the course of the next two years of surveying and collecting in Polynesia a second voyage to the Antarctic was made. Then, having visited the Marquesas, New Hebrides, New Caledonia, and Pitcairn Island, the *Resolution* rounded the Horn and reached England on July 29, 1775.[12] One of Anderson's shipmates on this voyage, Lieutenant Charles Clerke, was again associated with him; on Cook's next voyage he became Commanding Officer of H.M.S. *Discovery*, which sailed as consort to the *Resolution* in 1776. Like Anderson he must have developed the seeds of tuberculosis during the voyage of 1772–1775, for when they next left England they were both sick men, and Clerke died a year after Anderson at the age of thirty-eight.[18]

Another of Anderson's companions in the *Resolution* in 1772 was George Vancouver (1757–1798), rated an A.B. and aged fifteen. He was a midshipman under Captain Clerke in the *Discovery*. Vancouver too was destined to develop phthisis after his great voyage of 1791–1795 and died of it at the age of forty-one.[15] Perhaps the most important association which Anderson formed during the voyage of 1772–1775 was that with the two enthusiastic naturalists, Johann Reinhold Forster and his son Johann George Adam Forster, the latter at that time little more than a boy. They probably taught Anderson much during the three years and when he next went to sea he armed himself with their recently published "Characteres Generum Plantarum" (fol. 1775) describing the Australian flora. There is, however, no reference to the Surgeon's first Mate in their "Observations made during the Voyage . . . " (1778). When Anderson landed once more at Woolwich he was twenty-seven years old. He had been round the world on a voyage which in length covered three times the earth's circumference. James Cook had noticed his ability and begun a friendship, which caused him to take Anderson with him as Surgeon of the *Resolution* on his next voyage, and to refuse the services of a professional botanist.[14] Cook wrote,[13] "Mr. Anderson, my Surgeon, who, to skill in his immediate profession, added great proficiency in natural history, was as willing as he was well qualified, to describe everything in that branch of science which should occur worthy of notice." Anderson had already begun his studies in ethnography and geology, meteorology and anthropology. Daniel Solander, the naturalist of Cook's first voyage, wrote to Sir Joseph Banks after visiting the ships at Woolwich on August 13, 1775, that "Mr. Anderson, one of the Surgeon's mates, has made a good botanical collection."[22] Anderson had also written "Characteres breves Avium," a description in Latin of birds seen during the voyage.[2] Of the expedition Cook wrote[13] that Anderson had "been of singular service, by enabling me to enrich my relation of that voyage with various useful remarks on men and things," and he published with his account of it[12] vocabularies of the South Sea Islands supplied by the Surgeon's Mate.

Anderson was paid off from the *Resolution* on August 25, 1775. From October 11, 1775, to December 9, 1775, he served as Surgeon in H.M.S. *Milford.*[19] He joined the *Resolution* as Surgeon on February 15, 1776; this was not the *Resolution* of the former voyage, but a barque built at Whitby a year and a half previously.[1] She was as unseaworthy, however, and Cook wrote that "If I return in the *Resolution*, the next trip I may venture in a ship built of gingerbread."[21] Cook had in the interval been promoted to Captain (1775) and the command of Greenwich Hospital, where he would have had opportunities to obtain the services of other surgeons for his next expedition had he wished. It was about this time that Gilbert Blane arrived in London to compete for a fashionable practice under the patronage of Lord Holdernesse. That other great figure in naval medicine, Thomas Trotter, did not join the service for another two years.

Cook hoisted his pennant in the *Resolution* in the Thames on February 10, 1776. The *Resolution* and the *Discovery* commissioned at Deptford, the former with a complement of one hundred and twelve men. They were unusually happy ships. Of the *Discovery*, James King, who succeeded to the command on Clerke's death, wrote, "It is doing bare justice to the seamen of this ship to declare, that they were the most obedient, and the best disposed men I ever knew, though almost all of them were very young and had never before served in a ship of war."[18] In the *Resolution* there were many incidents which testify to the same spirit.

Two Surgeon's Mates were appointed under Anderson. The first mate, who was later (1778) to succeed Surgeon John Law (Appendix 9) in the *Discovery*, was David Samwell, or Samuel (Appendix 8). His journal[20] has been of value in supplying some new facts about Anderson.

The two ships left England on Cook's last voyage on July 12, 1776, their purpose being to find whether the North-West Passage existed. Their orders were to cruise first in the Southern Pacific, to annex new discoveries, to plant the seeds with which they were supplied, and to distribute the animals they carried on board among the islanders. Trading relations were to be established. The expedition was to include so much besides hydrography that Anderson had ample scope and considerable responsibility. Events show that he justified Cook's choice, and contributed more than has been recognized to the value of the reports which were brought back to England. Anderson was at this time in a precarious state of health[18] and was risking much in venturing on a voyage fraught with hardship, in a vessel of 460 tons, in which the food supply would be a matter of continual concern (Cook himself remarked later that what they ate was "sometimes exceedingly nauseous") and in which he would pass through extreme climatic changes. He had, however, few ties in England; in his will[8] made during the voyage, he only mentions an uncle, William Melvill, living at North Berwick, Mains, Haddingtonshire, and his sisters, Betty and Rabinah.

The account of this expedition was published in three volumes[13,18] six years after Cook's death. The first two volumes are formed from his log books and journals, but very extensive use was made of Anderson's manuscripts, which contributed entire chapters and all the details of matters other than hydrography. In the Editorial Preface this is generously acknowledged.

> This Volume is enriched with considerable communications from Mr. Anderson, Surgeon of the *Resolution*. The confessed abilities, and great assiduity of Mr. Anderson in observing everything that related either to natural history, or to manners and language; and the desire which, it is well known, Captain Cook, on all occasions, shewed to have the assistance of that gentleman, stamped a great value on his collections.

His journal, by the order of Lord Sandwich, was put into the hands of the Editors and the information made use of which it was "found to contain, about matters imperfectly touched on, or altogether omitted in Captain Cook's manuscripts." Anderson left all his papers to Sir Joseph Banks,[8] but his journals appear to have been impounded by the State and are now at the Public Record Office. Great pains were taken in the production of these three volumes. Banks played an active part and George III took a personal interest in the publication. Cook in his journals was liberal in his praise of Anderson: "Mr. Anderson, my Surgeon, who to skill in his immediate profession, added great proficiency in natural history,"[13] and similar entries are of frequent occurrence. When the surgeon died and he was left to pursue his observations on ethnography and philology alone, he wrote with regret: "After Mr. Anderson's death, we had few who took much pains about such matters."[13]

The equipment which Anderson took with him for this expedition is only occasionally referred to in the published account but can be reconstructed from other books. He had reagents, a blowpipe, and a microscope for examining geological specimens; spirits of wine and casks for preserving fish and other zoological material; and the somewhat inadequate supply of drugs allowed at that time—one man down with "fever" consumed the entire stock of Peruvian bark for the voyage; fortunately there were no other cases. In order to obtain his specimens from the natives the surgeon was allowed to draw on the ship's supply of trading articles, beads, hatchets, pieces of iron.

His library was chosen with great care. On April 23, 1776, from the *Resolution* at Deptford, Anderson had written to Sir John Pringle, who, as President of the Royal Society, had asked him to describe an outbreak of fish poisoning met with in the *Resolution* off the Island of Malicolo in the South Seas, July 23 to August 3, 1774.[4] Anderson was evidently in touch with this learned club of which Banks was such a brilliant member and subsequently president, but it was probably due to Solander's letter that Anderson came under the notice of this remarkable man. Bank's interest with Lord Sandwich was high; his overflowing purse and kindly patronage were extended to naval surgeons interested in natural history; his guidance and strong support made smooth the path of Surgeon Archibald Menzies, when he came into conflict with his captain, Vancouver;[15] his munificence made possible the publication of Surgeon William Houston's "Reliquiae Houstoniae" (London, 1781), notes on a herbarium of rare plants from Mexico and the West Indies; his generosity is shown in his correspondence with the unhappy and indigent William W. Ellis, Assistant Surgeon on Cook's last voyage and author and illustrator of a well-written account of the expedition, which was the first to be published.[21] Anderson's connection with Banks is shown by a letter, written by him to his patron from the Cape of Good Hope, on November 24, 1776, a transcript of which is preserved in the library of the Botanic Gardens at Kew, and in his will: "I leave to Joseph Banks Esquire the Natural Curiosities I have collected during this voyage with some Manuscript Notes relating to them."[8] He was probably one of the naturalists made welcome to the library and collections at 32, Soho Square, where Banks extended hospitality to scientists of all nations. In his paper on South Sea fishes Anderson states that he was able to identify them through Banks's drawings. He was moving in this circle just before he left England in 1776, a factor which may have influenced his choice of books to take to sea with him. Among others there were three volumes of Dampier's Voyages, and Hawkesworth's account of Cook's first voyage, giving details of the Australian native races, ethnography and languages; Pernetty's "Voyage à la Nouvelle Guinée"; Hasselquist's "Iter Palaestinum" on fishes; Thomas Pennant's "Synopsis of Quadrupeds" (1771), Sydney Parkinson's "A Journal of a Voyage to the South Seas in H.M.S. Endeavour", on plants; and the volumes of the Natural System of Linnaeus. All these books passed to David Samwell on Anderson's death.[20]

Throughout the voyage Anderson was continuously occupied. At sea he wrote up his voluminous notes, in harbor he was the companion of Cook on expeditions ashore, or took solitary walks in pursuit of matters of interest for his projected book on the work of the expedition.[7] Anderson's intention of writing for publication is unfortunate in that it made him write from a curiously impersonal point of view. His writings supply no indication of his character, but his varied talents can best be appreciated by following the account of the voyage as told in his journals and in the official publication, and by passing in review such other of his manuscripts as have survived. In addition to his three volume journal he was keeping a volume of notes and a catalogue of the collections he was forming. This was classified in botanical and zoological sections under the titles "Genera Nova Plantarum," together with "Zoologia nova seu Characteres & Historia Animalum."[3, 6] Minute details are given throughout in both Latin and English of the new species he met with, and it testifies to his sound knowledge that what he described as new was subsequently confirmed as such. Dr. John Latham, the distinguished nineteenth century physician and botanist, made use of some of Anderson's descriptions when drawing up his great Catalogue of Species. Anderson's note book, which has never been published, was divided up into its component parts in 1898; these are in the appropriate departments of the British Museum of Natural History. The specimens, of which these books were but the index, must have occupied long hours of examination and preparation.

Anderson's death and the subsequent events of the voyage made their dispersal almost inevitable. Some are said to have been left in Russia in the winter of 1779, as security for supplies received by the ships, and never redeemed. These may be in Moscow, but some were brought home and were sent to the collections of Sir Joseph Banks and Sir Ashton Lever, the latter of whom had a large museum in Leicester Square. At the dispersal of the Leverian Museum some of the contents were purchased by William Bullock, to whom apparently Banks also gave part of his collections, and exhibited by him at the Egyptian Hall, Piccadilly. This museum was sold in 1819. Most of the specimens left the country and some may survive in foreign collections, more especially that in Vienna. Some of Anderson's plants, his "hortus siccus," were incorporated in the Banks Herbarium, and appear there at the British Museum of Natural History, mounted on the same whitish-brown paper as the remainder of the collection, but with Anderson's labels in some cases. Banks's library and collections were transferred to the British Museum in 1827. There is also a specimen of William Anderson's in Robert Brown's herbarium, acquired by the British Museum of Natural History in 1876. Anderson's herbarium, or what was left of it, when examined by Sir Joseph Hooker in 1843, was found to have been much injured by insects, many specimens being destroyed.[9] His manuscripts have suffered a similar fate and some of the most valuable ones have disappeared. When in 1779, after three years of voyaging and two winters in the ice the *Resolution* and *Discovery*, lying in the harbor of St. Peter and St. Paul in Kamchatka, were found to have become so leaky that fears were entertained for the safe return of the expedition, it was decided to dispatch the most valuable records of the voyage home to England, and Cook's papers with those of Anderson were sent under convoy of the Governor of Kamchatka to the British Ambassador at the court of the Empress Catherine. From St. Petersburg they were eventually forwarded to the Admiralty. The news of Cook's and Anderson's death was then made public for the first time. These vicissitudes together with the passage of a hundred and fifty years have left little biographical material in the case of the latter. Had Cook lived more might have been known.

On the way to the Cape of Good Hope the ships called at Santa Cruz, Teneriffe, for three days. Anderson spent much of the time ashore and his notes supplied a chapter[13] on the state of the island, its scenery, geological formation, natural history, town planning, architecture, folk-lore, employments and labor conditions, products and trade, and what could then be learnt of its primitive inhabitants, the Guanches, who were almost extinct. The climate appealed to him as suitable for consumptives; he may have recognized in himself the beginnings of his fatal illness. On the fourth of August they left Teneriffe. Six days later the *Resolution* was very nearly wrecked according to Anderson,[7] who severely criticized Cook for "hazarding" his ship. This asperity may have been the outcome of his illness or of the conditions under which he was living on board. As the ships sailed south the timbers shrank and they became very leaky; the surgeon and other gun-room officers were all driven out of their cabins by the water which poured in through the sides. The gun-room with its single port was dark and damp and the cock-pit provided little comfort.

By October 18 they were at Cape Town and during the following month, while the ships were being recaulked, Anderson was able to make an expedition up country. This he did at the request of Francis Masson (1741–1805), a fellow Scot, who had been sent to South Africa from the Royal Gardens at Kew to collect plants. Masson arranged for him to visit the tract of country known as the Pearl, where there is a great granite rock rising high and bare from the hills, the Pearl Diamond. Anderson made a careful survey of this geological curiosity, and on November 24, 1776, wrote a report,[5] which, with specimens, he sent to Sir John Pringle. Like his communication on poisonous fishes this was read before the Royal Society. It is noteworthy that whatever he investigated, whether the "saxa conglutinata" of the Pearl Diamond, or the "sparus pagrus" which poisoned the ship's company of the *Resolution* in 1774, or the birds and plants in which he was more immediately interested, Anderson was able to recognize and name them or to declare them correctly as new discoveries.

At the Cape he was joined by David Nelson, the gardener, who was appointed to the *Discovery;* together they made expeditions to collect plants and seeds for Sir Joseph Banks. Among Anderson's ship-mates in the gun-room of the *Resolution* Nelson met the young sailing master, William Bligh. The future admiral of the blue was then aged twenty-two. Both men were together again during the mutiny in the Bounty, when Nelson died from exposure and exhaustion during the famous three thousand mile journey in an open boat. Before they left Cape Town on November 30 Anderson had noted in his journal the nature of the country, the villages, water supply, agriculture, and climate.

The ships next made for Kerguelen's Land, and the harbor in which they anchored on the twenty-fifth of December still appears on the charts as Christmas Harbour. Anderson was especially interested in the cabbage plants growing there, which he named "Pringlea" after the aged pioneer in military hygiene. "To Anderson we owe all that was known of the flora of Kerguelen's Land, prior to the Antarctic Expedition of 1840."[9] Hooker rediscovered Pringlea and gave it the specific name "antiscorbutica.[16] Anderson himself is commemorated in the genus "Andersonia," so named by Robert Brown,[10] the associate of Banks and father of the Linnaean Society. Anderson's interest was not only academic; he was anxious to find plants which might be of value in preventing scurvy, and grasses which would be serviceable as forage for the sheep, horses and cattle, which the expedition was taking to the South Sea Islands. It was he who decided from the leaves of which trees the "spruce" beer should be brewed, a decoction much valued by Cook as an antiscorbutic.

On January 26, 1777, the ships anchored in Adventure Bay, Van Diemen's Land, remaining there till the 30th;

> Mr. Anderson, my Surgeon, with his usual diligence spent the few days . . . in examining the country. His account of its natural productions, with which he favoured me, will more than compensate for my silence about them; some of his remarks on the inhabitants will supply what I may have omitted or represented imperfectly.[13]

By the middle of February they were in Queen Charlotte's Sound, New Zealand, the site of a tragedy during the previous voyage, when a boat's-crew from the *Adventure* fell victim to the cannibals. At this time there were only two men on the sick list of the *Resolution*. This is one of the few medical notes that remain of all Anderson's industrious records. The sick-books are lost, but from the careful histories with daily notes, which he quotes in his paper on fish poisoning, we know that his clinical interests did not lag behind those of the naturalist. During the twelve days they remained in the Sound, Anderson investigated the character of the country and its climate, making meteorological observations. In addition to examining the fauna and flora, he supplemented the then scanty knowledge of the customs and appearances of the Maori race, observing their dress and ornaments, their houses, food, cookery, weapons, boat building and other arts. He collected a small vocabulary of their language.

Throughout March and April the ships sailed northward, stopping at various small islands of the Friendly group. Anderson's spelling of their names was adopted on the chart of these and of the Society and Sandwich Islands, which was later engraved. His authority was also accepted for all the names in the published report covering this period of the voyage. He completed what is practically a small dictionary of the Friendly Islands language, nearly 650 words of which were printed as an appendix to the report.[18] It is this collection to which Anderson probably refers when he writes in his journal for 1777[7] of a manuscript book which he had in his cabin "Vocabularies of the Indian Languages amongst the Islands of the South Seas." He refers also to his manuscript of "The General History of a Voyage made in the Resolution in the years 1772, 1773, 1774, and 1775." This has been lost and cannot have been used in Cook's own account,[12] which was being published in London that year.

In June they went to Tonga. Here, as elsewhere in these South Sea Islands, he went ashore with Cook and attended the ceremonies arranged in the Captain's honor. In the evenings there was generally an entertainment with boxing, wrestling, and native dances. Anderson accepted the charm of the islanders' music, but while he listened to the "inexorable and unfaltering delirium of the drums," he remained a detached spectator, noting with scientific and dispassionate interest the pattern of the dances. Their description has been preserved chiefly in the surgeon's words; "The skill of that gentleman in directing his enquiries, will, in some measure, supply the imperfection of my former account of this island."[13] Anderson accompanied Cook on his diplomatic missions to native chiefs, partly in the capacity of interpreter, partly to obtain information. There were found to be over a hundred and fifty islands in the archipelago; "Mr. Anderson, with his usual diligence procured all their names."[13] His remarks on the natives, their diseases, cleanliness, clothes, practice of tattooing, etc. occupy much of two chapters of Cook's account. In July, 1777, they left the Friendly Islands and went to the Society Islands, where his knowledge of the language from his previous studies again proved most useful. Samwell says of him;[20] "Having taken some pains to learn the Otaheite language he was better acquainted with it than anyone in the two ships" and adds, "he was the only Person amongst us who could pretend to any degree of knowledge in Botany." In September, 1777, he had the unusual experience of attending a human sacrifice with Captain Cook and the artist, Webber—fortunately the victim was already dead (Appendix 7). He was interested in their religious beliefs and his curiosity as usual led him to investigate every detail; he noted among other matter the remarkably good method the islanders then had of embalming corpses. By the autumn the ships were overrun by rats, and plagued with black-beetles:

> We carried ashore the bread remaining in the bread-room, to clear it of vermin. The number of cock-roaches that infested the ship, at this time, is incredible . . . if food of any kind was exposed only for a few minutes, it was covered with them; and they soon pierced it full of holes, resembling a honey-comb . . . according to Mr. Anderson's observations, they were of two sorts, the "blatta orientalis" and "germanica."

The black-beetles lay concealed in the rigging so that "when a sail was loosened, thousands of them fell upon the decks." At night also they appeared and "made everything in the cabins seem as if in motion."[13] But Anderson never interrupted the course of his researches and writing, whatever the conditions he worked under might be. His observations at Otaheite form a chapter in the second volume of the "Voyage." He investigated the local surgery and physic, the affects of drinking "Ava," the diseases and domestic hygiene of these people, as well as their history, folk-lore and government. His serious manner of cross-questioning the natives was such as to fill the more timid with a sense of guilt and precipitate a retreat.[18]

On December 8, 1777, the *Resolution* and *Discovery* left the Society Islands and all their prodigal luxuriance for the long voyage to Alaska in search of the North-West Passage. Anderson had spent his leisure in preparing and classifying his dried birds and small animals, attaching their Latin names to each, but the black-beetles were attracted by the ink on his labels and finally they attacked his specimens as well. There is little reference to ship's duties at this time, but from his journal he appears to have supervised the standing health orders which Cook had established from the outset (Appendix 5). These follow the lines suggested by Stephen Hales thirty years previously and the continued good health of the ships' companies is a tribute to the wisdom of this early authority on naval hygiene. On their way north the ships discovered the Sandwich Islands and Anderson collected yet another considerable vocabulary. It was largely through this that they were able to investigate the character of the islanders and to barter with them.

They approached the west coast of North America in March and met with hail and sleet and thick, hazy weather, or gales of wind and rain; the thermometer had fallen 30° since they left Otaheite, the ships were once more very leaky and the food supplies inadequate. The surgeon must have realized that his hopes of returning to Scotland were rapidly diminishing. Nevertheless, at Nootka Sound (Vancouver) he was much interested in the Indians and here and at King George's Sound managed to collect another vocabulary of 250 words. In these matters Cook wrote that he "owed everything to him."[13] Throughout the greater part of June the weather was raw and cold with mist and drizzling rain. Working by the light of lamps fed with seals' blubber Anderson had added each evening to his pages of manuscript, but by the third of June he was either too ill or too despondent to continue the records he had kept with such care.[7] He lay in his cabin tended by Joseph Collett and William Starling, the gun-room servants. The *Resolution* continued to creep northward through the fog banks, which often made it impossible to see the length of the ship. On July 21, 1778, realizing he was "without any prospect of Recovery,"[8] he made his will. Some days before they saw the blink of ice on the northern horizon the end came. On the afternoon of an overcast day, the ship sailing gently in a moderate breeze, Anderson died. Somewhere off the west coast of Alaska, about latitude 62° N., longitude 192° E., they "committed the Body of the Deceased to the Deep. Sounded 12 fathm." (Ad. 51/4560.) Cook wrote in his journal

> Mr. Anderson, my Surgeon, who had been lingering under a consumption for more than twelve months, expired between three and four this afternoon. He was a sensible young man, an agreeable companion, well skilled in his own profession; and he had acquired a considerable knowledge in other branches of science . . . had it pleased God to have spared his life, the Public, I make no doubt, might have received from him such communications, on various parts of the natural history of the various places we visited, as would have abundantly shewn, that he was not unworthy of this commendation.[13]

This was high praise from Cook, who nowhere else during this voyage singled out any individual for especial notice. Samwell in his journal that day after paying a tribute to Anderson wrote "being withal a sensible and modest Young Man his Death was much regretted."

The compilation of this biography would have been impossible without the kind assistance and advice of Mr. T. H. Graham, Librarian of the Royal College of Physicians of Edinburgh; Mr. N. B. Kinnear, British Museum of Natural History; Mr. D. B. Smith, Admiralty Librarian; Dr. Ralph Stockman; and Mr. D. Thomson of the Royal College of Surgeons of Edinburgh, to all of whom my thanks are due.

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Appendix

1. "Anderson's Island" does not exist. Cook was mistaken in his hydrography and both the island previously named after Captain Charles Clerke and Anderson's Island now appear in the Admiralty charts* as the middle and eastern parts of the earlier discovered St. Lawrence Island in Latitude 63° N., between Alaska and the coast of Kamchatka. Anderson, however, needs no monument other than Cook's words, which show him to have a prior claim to Sir John Richardson to be known as "The Naturalist of the Naval Medical Service."

2. The following letter (J. M. Matra to Sir Joseph Banks, May 7, 1790, Addl. Mss. 33979/29.) requires some comment. Just after the news of the mutiny in the *Bounty*, April 28, 1789, reached England, he wrote, "Something what Bligh's people did was designed by most of the people of the *Endeavour* headed by Anderson and Gray, I think." The reference is to a proposed mutiny, when the *Resolution* was at Otaheite in the voyage of 1772–1775 in which Matra admits he was himself a ringleader. The letter was written seventeen years later, the wrong name of the ship is given, the *Endeavour* being Cook's ship in the voyage of 1769, and the reference is undoubtedly to Robert Anderson, gunner, and James Gray, boatswain. Cook himself can have thought little of it for Robert Anderson was again gunner of the *Resolution* on

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*Bering Sea and Strait Pilot. Ed. 1, London 1920. Hydrographic Dept. of the Admiralty.

the last voyage of 1776–1780. Attention is drawn to this letter because in the "Life of Sir Joseph Banks"[21] the inference is made that the Anderson referred to is the surgeon.

3. William Anderson, Surgeon, has been confused in Watt's Bibliotheca Britannica Vol. I, p. 30, with William Anderson, M.D., a Fellow of the Royal College of Surgeons of Edinburgh in December, 1773, who resided in that city until 1786, serving as a member of the Deacons' Council and the Library Committee of the College during the period 1774–1786. The confusion probably arose through this William Anderson having also traveled and having written a paper on the "Use of the Cabbage-tree-bark as an Anthelmintic" in which it is stated that he "practised medicine for some years in the West Indies." (Medical & Philosophical Commentaries, by a Society in Edinburgh, Vol. IV, Part I, Ed. 2, London, 1790, p. 84.)

4. According to the manuscript copies of Cook's Journals of the *Resolution*, of which there are two volumes covering August, 1778, the date of Anderson's death is given as August 3, 1778 (Egerton Mss. 2177A. Brit. Mus. and Ad. 55/113, P.R.O.) In the Log Books, however, the date is given as the fourth and these as daily records with definite spacing are more likely to be accurate (Ad. 55/112, Ad. 55/114, Ad. 51/4560, P.R.O.). The date August 3, has, nevertheless, been accepted in the published account of the voyage and in the Dictionary of National Biography.

5. Cook placed hygiene before antiscorbutics and attended particularly to personal cleanliness, dry clothes, and a dry ship.[11] "Once or twice a week she was aired with fires, and when this could not be done, she was smoked with gunpowder moistened with vinegar or water. I had also a fire made frequently in an iron pot at the bottom of the well, which greatly purified the air in the lower parts of the ship." Of the rob of lemons and oranges he wrote on July 7, 1776, to Sir John Pringle, "I have no great opinion of these alone."

6. Will of William Anderson, P.C.C., Collins, 502. "In the name of God Amen I Wm. Anderson Surgeon of his Majesty's Sloop Resolution having been for some time in a Bad State of Health and now without any prospect of Recovery have resolved to make my last will and Testament thereby annulling every other will or Testament made by me heretofore and in the following manner after all my just and lawful debts are paid I leave or bequeath unto my Uncle Mr. William Melvill living or lately living at North Berwick Mains Haddingtonshire Scotland one half of whatever I may be possessed of at my death whether Money Goods & c I leave to my sisters Betty and Rabinah the other half of whatever I may be possessed of at my death to be equally divided between them I leave to Joseph Banks Esquire the Natural Curiosities I have collected during this voyage with some Manuscript Note relating to them I leave to Mr. Samuel of the Resolution what Books I have on Board except Manuscripts I leave what clothes or Wearing apparel I have to Joseph Collett and William Starling the Gun Room Servants and desire that this and the preceding article may be fulfilled at my death without waiting the Execution of the rest of the Will and I herely nominate and appoint Messrs. Thomas and William Maude in Downing Street Westminster Executors of this my last will In Witness whereof I have hereunto set my hand and Seal the twenty first day of July in the Year of our Lord one thousand Seven hundred and Seventy eight Wm Anderson Signed sealed published and declared by the Testator in the presence of James King A Dewar."

"This will was proved at London the fourteenth day of November in the year of our Lord one thousand Seven hundred and Eighty . . . by the oath of Thomas Maude one of the Executors named in the will to whom administration was granted of all the Goods Chattels and Credits of the deceased first sworn duly to administer, power reserved of making the like grant to William Maude the other Executor named in the will when he shall apply for the same.

"The balance of Anderson's pay was handed over to F. Maude, a Navy Agent, and Adam Jellicoe, Paymaster of the Navy, 29th December, 1780."

7. The Human Sacrifice: According to Cook's account[13] he visited this with Anderson and the artist, Webber. The latter made a drawing of the scene, which was published at the same time as the account of the voyage, but in a separate volume of plates. Webber has shown three Europeans on the right of the sacred enclosure. The one facing the artist is Cook, the one with his back to him is perhaps intended for Anderson, while the third figure in profile is certainly the Surgeon's

Mate, David Samwell. His characteristic features are unmistakable and can be compared with the silhouette at the British Museum and the engraving from a portrait painted in Paris in 1798. (Egerton Mss. 2591.)

8. David Samwell: This is the name which he appears under in the Surgeons' Servitude Record[23] and which he uses in his journal, but Cook and Anderson both call him Samuel. His naval career is given in full in the record named above and covers the period 1776 to 1796. Part of his journal was published as "A Narrative of the Death of Captain James Cook, to which are added some particulars concerning his Life and Character and Observations respecting the introduction of the Venereal Disease into the Sandwich Islands" 4to. London, 1786. (Ms. Egerton 2591.)

9. John Law: He was transferred to the *Resolution* from the *Discovery* on William Anderson's death. His journal from 1778 to 1779 is preserved in the British Museum manuscript collection (Add. Mss. 37327). It is a scanty and ill-kept fragment of a diary.

[From Erastus: Varia Opusculum Medica. Frankfurt-a.-m., 1590.]

JOHANN PETER FRANK AND HIS “SYSTEM EINER VOLLSTÄNDIGEN MEDICINISCHEN POLIZEY”*

By LEONA BAUMGARTNER, PH.D. AND
ELIZABETH MAPELSDEN RAMSEY, M.D.

NEW HAVEN, CONN.

PART I

“SIE haben die Regenten gelehrt wie sie ihre Untertänen gesund erhalten mögen,”[21] With these words Emperor Joseph II of Austria summarized the achievement of a man who is today almost forgotten. In an age which is witnessing an unprecedented development of the ideal of the responsibility of a state for the health of its citizens it is opportune that some notice be given to this man and to his great treatise which first codified the details of public health administration. Were this man to return today he would perhaps recognize little in modern public health organization which follows the precepts he laid down 150 years ago. In the Soviet experiment alone would he see at work the fundamental philosophy which dominated his great ideal. Nevertheless, his vision foreshadowed much that has developed in the intervening history of the public health movement and some things which still lie ahead of us. Most of the problems which he faced are still vital ones and some of his solutions are those which even today seem most practicable. He thought socially in an era which was still thinking individually. His monumental treatise, “System einer vollständigen medicinischen Polizey,”* covers almost the entire fields of public hygiene and medical jurisprudence as they are defined today.

The man is Johann Peter Frank, who is so interesting as an individual and so versatile as a scientist and educator that to omit details of his career is to make any estimate of his work incomplete. As Garrison says in his usual succinct fashion, he was a “rare and happy mixture of German thoroughness and French intelligence.” This at once reveals not only the story of his inheritance, but gives the key to his personality and accomplishments. The tale of a French grandfather, who during a campaign in the wars of Spanish succession married a German girl, only to be compelled to send her home again and thus to lose all track of her, is one full of romance. Their son accompanied his soldier father during another campaign but was all too soon left to fight his way alone. This he did in the world of trade and very successfully. Johann Peter Frank was one of the fourteen children born to the successful trader and his wife, a former mayor's daughter. He was born on the 19th of March, 1745, in the town of Rodalben not far from the Lake of Constance.

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* Although this has been variously translated as a system of public health or hygiene, of police medicine, public security,[3] or medical jurisprudence[5] or polity, it does not seem that any English term of modern usage covers the idea which the author meant to convey so we have chosen to leave the term “medicinische Polizey” untranslated, understanding it to be a discipline that includes all of the responsibilities of a state toward the health of its subjects.

* Based on a report presented at the Seminar of the Department of Public Health of the Yale School of Medicine by the senior author, a Sterling Fellow of Yale University. The authors wish to express to Dr. Arnold Klebs, Dr. C.-E. A. Winslow and Dr. John F. Fulton their gratitude for the many valuable suggestions and criticisms which they have made during the preparation of this paper.

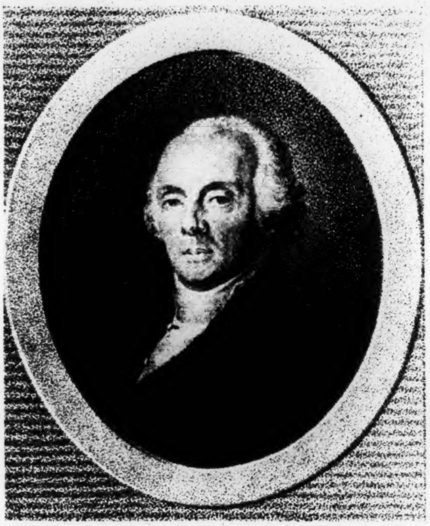
FIG. 1. JOHANN PETER FRANK. (FROM FRONTISPIECE TO "SYSTEM EINER VOLLSTÄNDIGEN MEDICINISCHEN POLIZEY," VOL. V, 1813.)

After some schooling in several provincial and parochial institutions, Johann Peter at the age of seventeen went to study physics with a well-known Jesuit in Pont à Mousson. There he became so enamored of biological science that in the following year, despite the opposition of his parents, he went to Heidelberg to study medicine. After two years he transferred to Strassburg where apparently he had his first clinical experience. At that time rounds of two hundred sick beds occupied about one-half hour and the only therapeutic measures used were bloodletting and purgatives, practices which impressed the young student deeply and which he says[10] led to his later reforms. He returned to take his examinations at Heidelberg and presented his thesis on "Diatetik des ersten Kindesalters."

At this time he had a noteworthy conversation with Oberkamp, an erstwhile pupil of Boerhaave's at that time Dean of the medical faculty at Heidelberg. The older man asked Frank what work other than the mere routine of practice, what truly creative work he wished to do in medicine. The pupil of twenty-one told of his observation that many diseases were of such a nature that some kind of public control was necessary—what the individual doctor and patient might do alone being insufficient. If there were no systematically conceived work which covered the principles of such control, Frank wished to formulate one. Oberkamp explained that there were only scattered ordinances and asked how Frank meant to christen his brain-child. Promptly the student gave his answer, "Medicinische Polizey," because it was essentially medicine but was to be administered by the officials of the state. This forms an interesting example of the medical student who adds to the history of medicine before he has finished his student days; for this conversation may well be said to mark the birth of a modern conception of public health and state medicine. How much Frank himself realized the significance of his ideas is questionable, but he was thoroughly interested in this child of his creation, for although soon in active practice in the small towns of Rodalben, Bitsch, Baden and Rastatt successively, he was constantly at work on his book of *Medicinische Polizey*. By 1768 one volume was finished but was refused by his chosen publisher, Macklot of Karlsruhe. The discouraged author threw the volume into the fire but the ashes were to rise again after he had had ten years of fertile experience from which to draw.

The next years were busy ones: a typhus epidemic in Gernsbach which he related to climatic conditions; days as *Hofmedicus* in Rastatt with the nearby library at Karlsruhe as a constant source of joy; a sudden interest in improving the conditions of midwifery and so developing a course for midwives with books, demonstrations and examinations; valuable experience as town and county physician in Bruchsal in charge of the garrison hospital and institutions for the poor in thirty-six villages; and finally, the post of personal physician to the Prince Bishop of Speyer. During this period, though clinical medicine was his avowed profession and although he published a good many papers in the field, he was constantly building up a rich background essentially of a public health nature. His work with local midwives has already been mentioned and was begun anew in each community. He tells in his most interestingly written autobiography[10] that his supervision lead to a reduction of maternal mortality in a given community from 1 death out of 85 pregnancies to 1 death out of 125, a reduction from 1.18 per cent to 0.86 per cent. The latter figure is certainly indicative of a high standard, for over one hundred years later, following the discovery of aseptic methods, the mortality figure in the same community had only been reduced to about 0.34 per cent.[7] He established a surgical college with clinics for unusual cases; inspected and regulated the activities of apothecaries; surveyed the field of veterinary medicine, pleading for a closer association of this branch with basic medical science for the benefit of both; wrote tracts on puerperal fever and rabies; and even outlined the duties of all court and state officials in regard to everything touching health problems. In these instructions he went so far as to outline what must be included in the quarterly examination of the court kitchens.

In 1779 the first volume of the "Medicinische Polizey" appeared, published by Schwan, the printer of Schiller's "Robbers." Two additional volumes were added in the next four years. By this time recognition began to come and following a great public ovation in a Frankfurt medical meeting, he accepted a call to the chair of professor of clinical medicine in Protestant Göttingen although he had almost simultaneously been appointed to posts at Pavia and Mainz. The following year, 1785, he went to Pavia to replace Tissot, the famous practitioner from Lausanne. Here his fruitful period really began. For ten years he took on more and more responsibility in both state and university until he was finally promoted to the post of *Protophysicus*, a kind of medical dictatorship of all of the Austrian Lombardy, and, as a contemporary has said, "Frank was a European name."[20] His northern energy instituted many reforms. Medical school curricula were first attacked (VI and Supp. I and II*),

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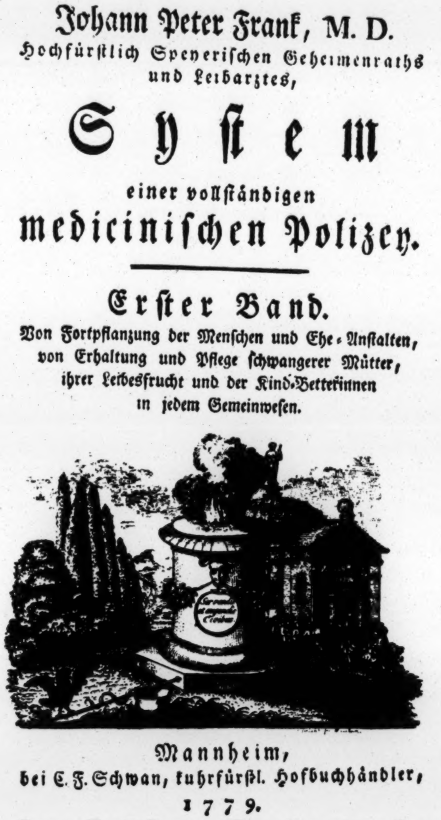
* References in Roman numerals are to the volumes of the first edition of the "Médicinische Polizey." See bibliographical notes in the Appendix.



Johann Peter Frank, M. D.
Hochfürſtlich Speyeriſchen Geheimenraths
und Leibarztes,

Syſtem

einer vollſtändigen
mediciniſchen Polizey.

Erſter Band.
Von Fortpflanzung der Menſchen und Ehe-Anſtalten,
von Erhaltung und Pflege ſchwangerer Mütter,
ihrer Leibesfrucht und der Kind-Betterinnen
in jedem Gemeinweſen.

Mannheim,
bei C. F. Schwan, kuhrfürſtl. Hofbuchhändler,
1779.

Fig. 2. Title Page of First Volume of First Edition of "System einer vollständigen medicinischen Polizey."

lectures for the year increased from 80 to 160, students given two years of definite clinical work in wards, surgery students required to attend medical lectures, clinics continued during vacations for eager students, a pathological-anatomical museum and chairs of comparative anatomy and general anatomy and physiology established, and a full-time chemist employed. The midwives and apothecaries were brought under his jurisdiction and subjected to the same rigid inspections he had instituted in Germany. He planned a model hospital for Genoa. He travelled over much of Italy and Switzerland[6] filling his notebooks with observations of medical jurisprudence, clinical practices, or botany, his cherished hobby (Supp. Vol. I and II), and visiting most of the famous people of his time. During this period he compiled the first volume of "De curandis hominum morbis epitome," a system of therapeutic medicine which was finally expanded into six volumes, translated into many languages, and became one of the standard works of its time. Another volume of the "Medicinische Polizey" appeared.

But all did not run smoothly; soon the faculty were quarreling.[6] Appeals and correspondence with Kaiser Leopold ended in Frank's going to Vienna in 1795 as director of the Allgemeine Krankenhaus and professor of clinical medicine. Again university curricula were quickly revised with the same emphasis upon actual clinical experience for the student. The hospital was very unsatisfactorily housed and inefficiently managed, but Frank's insistence upon detail brought many improvements, until the institution was recognized as one of the finest in Europe. He developed the first pathological museum from the nucleus of a small private collection which had just been started, established a medical library, and undertook experiments with Jenner's new vaccination, possibly largely under the stimulus of Jean de Carro. They were golden years when Frank was almost the center of the group which had been so splendidly formed by those two pupils of Boerhaave's, van Swieten and de Haen. But after nine years, dissatisfaction again arose and Frank accepted a call to the chair of clinical medicine in Wilna and soon another to become personal physician to the czar and director of the medical-surgical academy[28] in St. Petersburg. Ill health, which always seemed to follow him to northern climes, precipitated his departure from Russia after three years. His desire was to return to Freiburg and complete the writing of his "Medicinische Polizey" begun almost thirty years before. Napoleonic wars detained him in Vienna but the delay brought him a call to become one of Napoleon's attending physicians. He plead that he was weary of active life and declined.[9] By 1811 he was quietly settled in Freiburg, but by 1817 he had returned to active practice in Vienna and numbered among his patients at the time Beethoven and the young King of Rome. On April 24, 1821, surrounded by many of his old pupils, he died of apoplexy.

Frank was a handsome, well-built man of rather serious and dignified mien, who, though several times attacked by various infections, seems to have outgrown a childhood debility. In Neuburger's collection of memoirs of "Das Alte medicinische Wien"[19] are many descriptions of him by old pupils or associates. One describes him at the height of his regime in Vienna promenading among the famous people of his time, an elegantly dressed man looking as though he had just come from his *friseur* and often referring to one of the two gold watches he carried. Another tells of his eloquence in Latin, German and Italian. In an absorbing travelogue written at the time of the Congress of Vienna, Richard Bright gives the following picture[5]:

> Of all I have mentioned, Dr. Frank is best known to the world, by his numerous and learned writings. Few men have spent their lives in more active labours of usefulness. . . . His wish was to avoid practice and to devote himself to his literary pursuits: but notwithstanding this, he has much practice forced upon him as a consulting physician. The remainder of his time is occupied in completing the works he has begun, particularly his elaborate treatise upon medical jurisprudence. He is a man of the most instructive and pleasing conversation, with great knowledge both of books and men, and is most universally respected. He is now above seventy years of age, is perfectly firm and upright, and in all his faculties and dispositions possesses the force and energy of youth, tempered by the mildness of advancing years.

Doll,[7] from examination of various state papers in the provinces of southern Germany, offers considerable evidence that the young Frank was often at odds with his employers about salaries and additional benefits he was to receive. Several biographers have referred to the extraordinarily high stipend of 5000 guldens for which Frank came to Vienna.

He married twice, once a sweetheart of his early student days in Pont à Mousson and later Marianne Wittlinsbach, the daughter of a city official of Rastatt. Two daughters and two sons were born of the second union. Both sons took up medicine. Franz, the second son, died of typhus, supposedly contracted through the unsanitary conditions in the hospital in Vienna where he had recently joined his father. Joseph, the elder son, was a colorful personality who married the singer for whom Haydn wrote the rôle of the Archangel Gabriel in "The Creation."* He settled in Wilna as a professor of Pathology and stayed there until he retired to a villa on Lake Como.[21] A nephew and pupil, Louis Frank, also had an interesting medical career. He specialized in tropical medicine, studying and practicing in Cairo and Korfu, and ending his days as personal physician to the Maria Louisa, Duchess of Parma, who was Napoleon's second wife.

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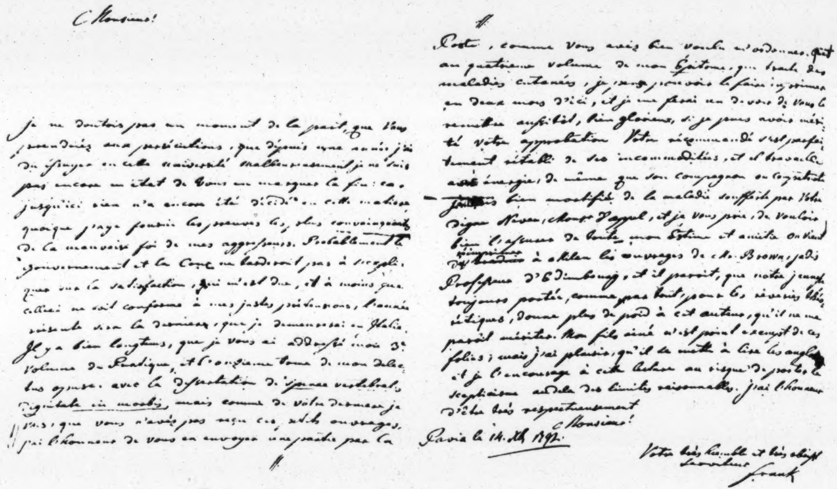
* An interesting picture of the musical life of the Franks is given in the following quotation, based on contemporary writings. "Beethoven was further to be met with at



Monsieur!

Je ne doutois pas un moment de la part, que Vous prendriez aux persécutions, que depuis une année j'ai dû essuyer en cette université. Malheureusement je ne suis pas encore en état de Vous en marquer la fin: car jusqu'ici rien n'a encore été décidé en cette matière, quoique j'aye fourni les preuves les plus convaincantes de la mauvaise foi de mes aggresseurs. Probablement le gouvernement et la Cour ne tarderont pas à [illegible] que avec la satisfaction, qui m'est due, et à moins que celle-ci ne soit conforme à mes justes prétensions, l'année suivante sera la dernière, que je demeurerai en Italie. Il y a bien longtems, que je vous ai addressé mon 3e Volume de Pratique, et l'onzième tome de mon Delectus opusc. avec la Dissertation de spinae vertebralis dignitate in morbis, mais comme de votre dernière je vois, que vous n'avez pas reçu ces petits ouvrages, j'ai l'honneur de vous en envoyer une partie par la // Poste, comme vous avez bien voulu m'ordonner. Quant au quatrième volume de mon Epitome, qui traite des maladies cutanées, je pense pouvoir le faire imprimer en deux mois d'ici, et je me ferai un devoir de vous le remettre aussitôt, bien glorieux, si je puis avoir mérité votre approbation. Votre recommandé s'est parfaitement rétabli de ses incommodités, et il travaille avec énergie, de même que son compagnon ou compatriote. Je suis bien mortifié de la maladie soufferte par votre digne Neveu, Monsr. Dappel, et je vous prie, de vouloir bien l'assurer de toute mon estime et amitié. On vient d'imprimer à Milan les ouvrages de Mr. Brown, jadis Professeur d'Edimbourg, et il paroit, que notre jeunesse toujours portée, comme par tout, pour les rêveries théoretiques, donne plus de poids à cet auteur, qu'il ne me paroit mériter. Mon fils ainé n'est point exempt de ces folies; mais j'ai plaisir, qu'il se mette à lire les anglois et je l'encourage à cette lecture au risque de porter le scepticisme au delà des limites raisonnables. J'ai l'honneur d'être très respectueusement

Monsieur!

Pavia le 14. [illegible] 1792.

Votre très humble et très obéiss. serviteur
Frank

Fig. 3. Facsimile of Letter from Frank to Tissot.

As a clinician Johann Peter Frank was ranked among the foremost men of his day. Though he was guided largely by contemporary tradition and superstition, many have insisted that no other man of his time was as little fettered by it.[4, 17, 21] Even as a child he laughed at the generally accepted notion that throwing a live crab over his shoulder into the river could cure him of malaria. His son, Joseph, says one of his father's greatest joys was to say, "Strike out this from my works. I thought it was true when I wrote it, but now I am convinced that it is not."[12] He tried many new methods and discarded many traditional practices, particularly the excessive use of bloodletting and purgatives. He described diabetes insipidus (1794) and perityphlitis (1792), was the first physician to emphasize the importance of diseases of the spinal cord (1792),[15, 16] and is often mentioned in the history of percussion and auscultation.[11] He followed closely contemporary experimental work, quoted Haller and Morgagni repeatedly, and applied the pure science of his day to clinical medicine as often as he could. He firmly maintained the importance of the basic sciences of anatomy, physiology and chemistry in the teaching of medicine. Considerable argument has arisen

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the musical parties of Professor Peter Frank, then director of the Allgemeine Krankenhaus, near which Beethoven lived for a time. . . . Professor Frank was a great lover of music and . . . his son, Dr. Joseph Frank, was still more so and a fine musician besides. He was wont to compose cantatas for his father's birthday, which were revised by Beethoven who often took part in their performance, playing the accompaniment to Frl. Gerach who was regarded as the best amateur singer of the time, was well acquainted with Haydn also and sang the soprano part in the first performance of his 'Creation' in the Schwarzenberg palace."[26]

about his advocacy of the Brunonian system. There seems to be little question that his son, Joseph, was an ardent follower of the Scotch physician during the greater part of his career. But it is interesting to be able to quote the following from an unpublished letter written by Johann Peter Frank (December 14, 1792) to Tissot: "They are now printing at Milan the works of Mr. Brown, formerly professor of Edinburgh, and it seems that our young people, as everywhere, are carried away by theoretical dreamings and give to this author more value than in my estimation he seems to merit. My eldest son [Joseph, *aet.* twenty-one] is not exempt from these follies, but I am pleased that he takes to reading the English and I encourage him in it at the risk of increasing his skepticism beyond reasonable limits."* (See Fig. 3.)

Any examination of his life indicates that as a teacher and administrator Frank was particularly successful. Over 7000 pupils listened to his scholarly lectures which were always delivered in Latin. Memoirs of the day[8, 18, 19] tell of students from all of Europe flocking to Pavia or Vienna to hear Frank. An intimate picture of him in a Viennese clinic describes an earnest figure, followed by 200 students, talking in Latin about each patient, recalling similar cases in his own experience and often impressing his point more clearly by relating his own errors than by didactic speech. His lectures on *medicinische Polizey* served as a pattern for hygiene instruction until the days of Pettenkofer. He emphasizes in his own version of his life and in the notes in the supplementary volumes his interest in medical school curricula and tells how his early experiences as a student had led him to wish to enliven and motivate the preclinical subjects and to give to students more experience at the sick bed, which is always "a trusty touchstone."[2] At both Pavia and Vienna he was part of a brilliant circle: Scarpa, Spallanzani and Volta in the former and the group known as the old Vienna school in the latter. Van Swieten and de Haen had just gone, but Stoll, Auenbrugger, Plenck and Stoerck were still there. His other talents seem to have been greater than his ability to work with his fellow professors, for in both institutions dissentions arose. This is not unusual in brilliant groups, but the root of the difficulties seems not to have been uncovered.

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* This quotation is most graciously supplied by Dr. Arnold Klebs of Nyon, who owns the original letter in French. His translation of the complete letter is as follows: "Sir! I did not doubt for a moment that you would take an interest in the persecutions that for a year I have had to experience in this university. Unfortunately I am not yet able to announce to you their end. Nothing as yet has been decided in this matter, although I have furnished most convincing proofs of the dishonesty of my opponents. Probably both Government and Court will not hesitate to pronounce themselves on the satisfaction owed me, but if this should not correspond to my just pretensions, the present year will be the last of my stay in Italy [Frank moved to Vienna only in Nov. 1795]. It is already quite a while since I sent you the third volume of my Practica, and the eleventh tome of my Delectus opusc. with the dissertation 'de Spinae vertebralis dignitate in morbis'; but since I learn from your last letter that you have not received these small works, I have the honor to send you a part of them by the Poste. . . . As regards the fourth volume of my Epitome which treats of skin diseases, I hope to go to press with it within two months, and I shall send it to you at once hoping that it may merit your approval. Your protegé has completely recovered from his indispositions, and he works with energy, the same as his companion or compatriot. I have been much chagrined by the malady that your worthy nephew, Monsr. Dappel, had to suffer and I beg of you to assure him of my entire esteem and friendship. They are now printing . . . [see in text] beyond reasonable limits.

I have the honor to be most respectfully, Sir, your very humble and very obedient servant.

Frank

Pavia the 14. Xbre. 1792"

Note by Dr. Klebs: 1794 Joseph Frank published his enthusiastic defense of Brownianism, "Lettera sulla doctrina di Brown al Sign. Brugnatelli."

One has only to think of the organization of midwives and apothecaries, the rebuilding of hospitals, or the founding of museums, clinics and libraries to realize Frank's really great gift in the administrative field. And if we examine the sum total of his accomplishment, attempting to understand why he was able to focus the attention of his contemporaries upon himself, it would seem as though his unfailing self-assuredness, his autocratic tendency to manage other people's lives for them which were fundamental traits of his character, together with a very real ability in synthetic organization, were the factors which made him a dominating personality. This personality at times seems to have the strength of a Mussolini and again the fussy over-efficiency of a pedantic spinster. At one moment he is stressing some meticulous detail of administration and at the next he is being carried away by some large, refreshing flight of imagination. It is however through his "Medicinische Polizey" that he is of greatest interest to our present age.

(*To Be Concluded*)

HISTORY OF INFLUENZA EPIDEMICS*

By JOHN F. TOWNSEND, M.D.

CHARLESTON, S. C.

IN tracing the history of the etiology of influenza one finds much of interest. For one can thus visualize the history of the etiology of disease in general; from the belief in ancient times of its origin in some impending fate or superstitious dread, on through the intervening stages to the more modern ideas of errors of sanitation and infection by bacteria, for

> . . . the ravages of epidemics like the great cataclysms of nature have in all ages appealed to the imagination and excited the terror of mankind. To the simple savage of the earlier generations, as among the savage tribes of the present day, an obvious similarity must exist between the havoc wrought by the fury of the elements—and that no less fatal—accomplished by the sudden outbreak of some malignant disease spreading with inconceivable rapidity and making countless victims.
>
> Earthquake and pestilence, meteors, volcanic eruptions and storms being alike abnormal and mysterious occurrences, the direct intervention of some supernatural agencies were deemed requisite to account for their apparent deviations from the settled order of the universe; all were attributed to the anger of an offended diety, as when Zeus, for an insult to his priest, by his thunder, sent sickness into the Argive camp.

> On mules and dogs the infection first began
> And last the vengeful arrows fix'd in man.

As knowledge increased the medical men of ancient days assumed other causes of influenza. Some held the cause to be a morbid miasma that floats in the air,[20] others held that it was "a gaseous emanation of telluric origin"[19]; and later it was thought to be some volatile or fixed principle emanating from the bodies of men and animals.[20] Baron de Tott claimed immunity from these emanations by directing, with his cane, the removal of the bodies that had died of the plague in Constantinople.[20]

In 1411 the French physicians claimed that the cause was a contagion *de l'air*, in 1414 a contagion *de le bise* or north wind.[19] This epidemic and the one of 1427 were supposed to be airborne.

Dr. Johnson quotes Van Swieten who calls it "a malignant catarrh that arose as it were from a certain vapor, since thick clouds of an ill smell preceded it for some days, then it suddenly broke out seizing almost instantly a thousand persons."[20] This description resembles the disease that recently occurred from some ill-smelling gas of unknown origin. It was called nebelsouch or fog plague in 1889–90, when the fog was supposed to have caused many deaths.[19]

Hildanus, becoming more concrete, supposed that the cause of the Plague at Lausanne and the neighboring districts was not only a contagion, but also some vicious quality of the air, which travelled from the sick to the well "sitting near."[20] In the monthly report of the Paris Faculty of Medicine in 1658 we find a paragraph stating that the disease was due to "les variations de l'atmosphere." In Italy, at the same time, the same view was held. The theory of its causation from temperature variations received further support from Sprengel, who, writing of the epidemics of 1742 and of 1782, said that influenza was due to a "sudden change from sudden heat followed by sudden cold," while Muncio, writing of the 1762 epidemic, expressed the same thought, when he said that it was caused by sudden cold followed by sudden heat.[19]

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* Read before the Medical History Club, Charleston, S. C., October, 1931.

The chemical composition of the air was again advocated as a cause in 1742, when influenza was said to be due to a phlogistic gas, over-stimulating the weakened body, producing a catarrh. And, when the chemistry of the air was still better known, Most, in 1820, becoming more specific, claimed that influenza was due to an excess of oxygen in the air.[19]

But a real advance in the contagious theory was made in 1762, when the disease was traced to people coming from infected areas; and in 1782, to persons, clothing and articles coming from infected districts. It was then said "that it began in a town or city and spread to the neighboring villages; that both on land and sea isolated imported cases invariably preceded the general outbreak," thus bringing forward prominently the contagious cause.

And so it went, miasma or contagion, contagion or miasma, but actually the miasmatists were hard pressed to explain the transference of influenza observed clinically, and the contagion advocates were equally hard pressed when confronted with records of whole communities succumbing in a night, as was recently illustrated at Cape Town in 1918.[17] Therefore, as clinicians we might hold to the contagious view, while as epidemiologists we turn to the miasmatic hypothesis.[19] But it was not until the 18th century that contagion, as opposed to the miasmatic cause, was clearly defined by Haygarth.[4]

Dr. Johnson, writing of the 1793 epidemic, gives instances of influenza occurring on vessels that had left a healthy port with a healthy crew, and weeks later had influenza break out. He says that while the warship *Atlas* was in the China Sea influenza broke out on board ship, and that it was later found to have started in Canton, China, at the same time. But as an argument against the theory of contagion, he gives reports of influenza breaking out in isolated, widely separated huts in the mountains with no communication between them. This fact, and the instance of the warship *Atlas*, may lead one to believe in the Epidemic Constitution, which idea will be developed later.

We find that in 1782 the Medical Council of Vienna declared that influenza was caused by persons inhaling air-borne or swallowing water-borne insects.[19] The name la grippe was also said to refer to insects, which by contaminating the air were supposed to cause the influenza. The same, with respect to insects, has been said of dengue.[4]

From early ages, in 1529, food poisoning has been blamed as the cause of some of the manifestations of influenza, as in Germany it has been said to have been caused by eating fish. In 1752 Swabian sausages were thought to be the cause; or it was thought to be due to ergot, causing Kriebelkrankheit; or to radish seed causing raphania. It was also said to be due to partaking of rye, peas, chickens, and many other articles of food or drink; all of which were declared to have caused illnesses now diagnosed as influenza, with this peculiarity, that many of the cases of food poisoning were found to be nervous or cephalic in their symptomatology, "die Nervenkrankheit, as Haberkron in 1772 called it." These epidemics were also called Kreibelkrankheit in Germany, and Raphania in Sweden, Scandinavia and Russia until 1800.[7]

The bacterial cause was, of course, not understood in the early history of influenza, but Seiffert in 1883 was one of the first to study the bacteriology of this disease. He found a Streptococcus pyocyaneus to be the cause. In the 1889 epidemic Klebs discovered the flagellata, while Rilbert, Vaillant and Vincent found the cause to be a streptococcus, but Weichselbaum, Kruse, Pansini and Marmorek ascribed influenza to the diplococcus of pneumonia.[19]

We have studied the parasites which develop under laboratory conditions and have held disease to be bound up with them. For instance, Creighton claimed that "the bacillus influenza was the sine qua non of influenza," but, says Hamer, "we forget that a particular parasite may be merely one of a series, and that it may in some cases be replaced in that series by another parasite, and for the time being and under the local conditions in question cease to have any connection with the disease at all. The records of epidemics suggest that some such explanation must be looked for, in order to reconcile the extraordinary persistence of disease types, with the no less remarkable variability of the organism to which the bacteriologist attaches importance, as the cause of the disease."[7]

Then an idea, that has since gained many adherents, was brought forward by Robert Donaldson. He thought that the streptococcus in the epidemics was of an unstable variety, which on culture became stable; that it was a pleomorphic organism.[9] That the disease is closely associated with a pleomorphus streptococcus of the pneumococcus group is now held by many; Donaldson thought that it belonged to type IV.[3,17]

This view was also held by Rajchmann who predicted the 1918 pandemic.[3,17]

Crookshank says that bacteriologically the pandemics of influenza are due to some bacillus or filter-passing virus,[7] and that epidemics of specialized| types are caused by association with other organisms; or that the cause of the epidemic may be a pleomorphus coccus or some physical condition that actuates that pleomorphus coccus.[17] Others have held that the prevalence, between the pandemics of influenza, depends upon some interaction between the "primary cause," whatever that is, and the various "satellite influences." Into this question symbiosis comes, "for the organism may be linked now with one and now with another ferment or enzyme." (Dixon.[7]) This doctrine may find application, for example, in the connection between the tubercle bacilli of bovine or of human origin; or the parasite or associated parasites of smallpox and vaccinia; of scarlet fever and diphtheria; (I have often seen these occur consecutively in the same house but not necessarily in the same patient); of dengue and influenza; of enteric fever and dysentery; of typhus and relapsing fever. We may even conjecture that immunity in some instances may mean that the parasite has been harnessed to some other parasite or enzyme which robs it of its virulence. (Hamer.[7])

Here, of course, we must not lose sight of the fact that the particular organism to which the bacteriologist has drawn attention, may of itself be a mere subparasite, capable of living symbiotically with the parasite in chief. Thus the influenza organism may at one time live in association now with one or more groups and then again with some other differently constituted groups of satellite influences, thus accounting for the variations in manifestations of influenza, especially during the interpandemic period. The manifestations of influenza are fairly constant in the agregate, at each pandemic phase, but undergo remarkable transformations in passing from one pandemic to another.[7]

So, one pandemic passed into another through the intervening trailers and precursors by means of the activation of carriers of the organism, whether this activation occurred by the influenza bacillus or by the streptococcus or otherwise. But only when this activation was due to the streptococcus did fatal and complicated cases occur.[8]

The prodromes and trailers of epidemics will be briefly referred to later.

In discussions of the bacteriology of influenza, Pfeiffer's bacillus has been prominent. But Donaldson in writing of "the bacteriology of influenza, with special reference to Pfeiffer's bacillus," says:

> In the 1918–19 pandemic of 19,145 examinations during life it was found in 34.4 per cent of cases and of 3056 postmortem examinations it was found in 39.8 per cent of cases. These cases represent a majority of the cases examined in many countries by many bacteriologists.[9] . . . Taking an average of nearly 20,000 cases, 62.9 per cent were entirely negative as far as the Pfeiffer bacillus is concerned.

Pfeiffer himself of 217 cases examined during life obtained only 51.6 per cent positive and of 30 cases examined post mortem only 66.6 per cent positive.[9]

If Pfeiffer's bacillus is the causal organism of influenza, then there is also a pandemic of 62.9 per cent of total cases of some disease due to some other organism, according to an average of the findings of all bacteriologists except Pfeiffer.

EPIDEMICS OF INFLUENZA

The epidemic of 1510 was accepted by all but there are accounts of diseases, that we now consider to have been influenza, that occurred in B.C. 412, and also in B.C. 393, when the Carthaginians were besieging Syracuse, and in B.C. 43 in Rome. In A.D. 591–92 the disease was characterized by much yawning and sneezing, which gave origin to the custom of making the sign of the cross over the mouth when yawning and saying "God preserve you" when anyone sneezed.[19]

Also there were epidemics in A.D. 837, 876, 889 and 932.[1] But authentic history begins with the epidemic of 1173, which was noted by Hirsh, for fatalities in pregnant women. In the epidemic of 1307 it was called by the French *le tac;* also *le borion.* The meaning of these names will be explained under Nomenclature. Other epidemics occurred in 1323 and 1327–28. In 1387 the disease was so prevalent that hardly one in ten remained healthy, but few succumbed. It occurred again in 1403–04 and 1410–11.[19]

Pasquier says that there were at least 100,000 cases in Paris in 1413–14; another epidemic occurred in 1427 and the 1510 epidemic was noted for frequent abortions in women, while in 1529 there was a pandemic of sweating sickness in all countries except France and Italy.[1] It was then referred to as the *pestis Britannica.*

In 1551 the epidemic in France was called *le coqueluche,* or, the fad of the moment and the same frivolous term was applied to the terrible pandemic of 1580.[1]

In 1557 was another one of the English sweats; which, on account of its posting character, received the name of "stop gallant and know they master."[7] Some say that the "sweating sickness" was not the same as influenza. They may be right, but many physicians, of many periods of medical history, have identified them as being the same disease, on account of their possessing the characteristics known to be those of influenza.[7] Some say that the dates here given are not those of influenza epidemics but Dwight M. Lewis[8] says that "what are often thought to be independent diseases and independent complications of such diseases are seen on careful examination to be interdependent diseases and interdependent complications. Many physicians have correlated all the diseases here mentioned as being influenza.[6,7] The correlation of epidemics, the identification of the various epidemic illnesses, as being influenza, will be referred to later, when opinions by Heusinger, Willis, Camerarius, Scheifferlius and others will be quoted.

To continue the list of epidemics: The great epidemic of 1580 was noted especially for two symptoms, being so sudoral as to suggest the return of the English sweat and so encephalic as to be called by Brunner the *Hauptkrankheit.* There were other epidemics in 1593 and in 1647. Cases of influenza first occurred in North America in 1626–27, but the first epidemic occurred in the western hemisphere in 1647.[19]

Epidemics occurred in 1675 and, in 1712, Camerarius called it *Schlafkrankheit.*[4] The nervous manifestations seem to crop out all along the line. There were epidemics in 1718, 1727, 1729, 1732–33, and 1741–42, in Edinburgh, "not one out of six or seven escaped."[19] They again occurred in 1767 and 1781–82. That of 1781–82 was most widespread. It started in the British army in India in November. It was in China during the same autumn; in Siberia and Russia in December; Germany in February, 1782; Denmark and Sweden in April; England and Scotland in May; France and Italy in June; and in Spain in August, again illustrating its posting character.[19]

The one in 1793 was described by Robert Johnson, who observed that epidemic and wrote of it.[20] There seems, then, to have been much influenza, a sort of epidemic constitution from 1799 to 1804, and the one that occurred in 1816 was especially fatal to children, killing in a few hours, as occurred in some of the cases in 1918. Epidemics also occurred in 1827, 1830–33, 1836–37, 1843 and the one in 1847–48 was noted for its bronchitis of the capillary form which was very fatal.[19] There were epidemics noted in 1850–51, 1855–58 and 1875–76, and in 1889–90 it was in both the western and eastern hemispheres, where it was called the *morbus maximus epidemicus.* Pandemic influenza again occurred in 1918–19.

Periodicity for epidemics has been claimed by some but has not been proved. Sydenham, I think, wrote on that feature.[19]

The average duration of a pandemic is about three months.[4,19]

Epidemics have not been proved to spread from east to west or from west to east as some claim, but they spread radially and by leaps and bounds and always by roads of intercommunication, using the route of travel, by person to person and country to country, illustrating their posting character.[7] The posting character is defined by Crookshank[4] as involving large areas of the globe and prevailing in affected communities for some three or four months at one time.

Some epidemics are very widespread. The one of 1781 has already been geographically outlined but the one of 1580 also involved millions of people and a wide territory: Asia, Africa to Constantinople, Venice, Sicily, France, Portugal, Hungary, Bohemia, Denmark, Sweden and Russia.[19]

Influenza has often been called a *new disease, novus morbus,* on account of its diversity of manifestations. Epidemics are also diverse. Different epidemics seems to pick out different organs; the toxin picks out one type of tissue and seems to limit itself to that tissue, as in one epidemic pneumonia predominates, in another gastrointestinal involvement; while in another it may be mastoditis.[1,19] In different countries there are different manifestations, even in the same epidemic, as in 1718 it was called in Picardy, *surette du Midi;* in France *la fièvre miliare;* and in England the sweating sickness.[7] And the 1820 epidemic was identified with cholera sudorale; with this should be considered the great increase in cases of "mucous" and "ulcerative colitis" of 1918 and 1920, which were trailers of the 1918 pandemic.[4]

Thus we recognize many manifestations of influenza epidemics, but, in order that there may be no confusion, many observers have correlated the different typical epidemics as being all influenzal.[6,7] One brief reference: Heusinger in his "Commentatio Semiologica" connected Guidetti's account of the 1712 epidemic with that of Willis in 1658; and Camerarius that of 1712 with that of 1580. And Scheifferlius in 1727 in a rare essay entitled "De morbo epidemio convulsive, per Holsatiam grassante oppido raro," identified that malady with that of Willis (1652–58) and that of 1580. "He was severely criticized for this but was vindicated by the occurrence of recurrent waves of influenza from 1729 to 1733, that continued throughout the world."[6] Many others have drawn together under one disease the many different types of influenza as it has occurred from its first recognition until now.[7]

We are therefore impelled to quote Fernel, Schiller and Benedetto, to recognize that certain diverse special diseases represent the recto and verso of one and the same pathological and epidemiological concept.[4]

PRODROMES AND TRAILERS OF EPIDEMICS

With pandemics there were trailers that came after the pandemic, sometimes attacking the same people who had already been sick, repeating ten, twenty, or more times and often with different types of influenza in the recurrence. Hamer quoted several cases illustrative of these repetitions in the same patient. That epidemics have predecessors and trailers has long been noted. Hamer wrote learnedly on this subject. Crookshank has shown by historical survey that influenza has a characteristic tendency to herald itself in the form of predromes of paralysis or other manifestations of encephalomyelitis, but he recognized that the "epidemic stupors" are no new disease but that they have been recorded with variations for 450 years, as predecessors or, as some say, *avant coureurs* or prodromes of a pandemic. Hippocrates recognized this when he said that the prevalence of encephalomyelitis has always stood in a certain relation to epidemics and endemics of "burning fevers," which we now call influenza.[7]

For instance, Malcoups of Brussels divided the historic influenza into two catagories; the one vernal, catarrhal and benign, as in 1658, 1742–43, and 1780; and the other autumnal or hermal and marked by "prodromes nerveux caractère adynamique gravité plus grande,"as in 1580, 1676, 1730, 1737, 1775 and 1837. The cases of encephalitis lethargica seen in May, 1918 should be reckoned among the *prodromes nerveux* of the pandemic of influenza of the autumn of 1918, which in point of fact combined Malcoup's two catagories.[6]

Literature is full of illustrations of physicians who have correlated the prodromes or *avant coureurs* and the trailers of epidemics and whose writings are too numerous to quote. However, Lombard expressed the aphorism that embodies the experiences of Hippocrates, Bellonious, Barthelini, the two Kammeisters and of Guidetti, when he said "La grippe est souvent précèdée par une constitution éminement nerveuse, dont les caractères principes sont de porter le trouble dans les fonctions du cerveau et des nerfs encephaliques," to which Ducros, Montain, Petroquin and Recamier agreed.[7] That is in brief, the opinion of many; a few illustrations are: The trailers of the 1550's epidemics were noted by Leichtenstein and avant coureurs of the 1580 epidemic by Bellonius. The trailers of the 1580 epidemic, occurring in 1581 were described by Ronsseus—they were like those in Belgium in 1557, which were supposed to be due to ergot; the illness began with spasticity or palsy of hands or feet, with half closed eyes, *oculi semi apertis*, open mouth filled with ropy mucous and tongue as if paralysed, all like botulism. This is parallelled by the account given by Breinl of the spasmodic form of Heine-Médin disease in Australia in 1917, occurring as prodromes of the 1918 pandemic; in both groups there were severe gastrointestinal disturbances.

Leichtenstein, writing of the 1550 epidemic, and also Blakiston and Graves, recognized and wrote of polymorphic nervous manifestations of influenza that occurred as trailers and *avant coureurs* of pandemic influenza.[1]

Many of the epidemics of 1825, called dengue, were incidences of "Spanish influenza" of the type seen in May and June of 1918, which were the precursors of the pandemic of that autumn.[7]

Huxham noted that the vernal catarrh of 1743 was followed by trailers in 1745 in the prisoners at Plymouth with a mortification of the feet.[4] This in 1889 was recognized as a sequela or trailer of influenza, a similar condition occurring after that epidemic.

NOMENCLATURE

It is curious to remark the regular and constant pace which the science of health and philosophy have kept with each other. As long as philosophers imagined the elements of natural bodies to be four, physicians supposed human bodies to consist of as many humors, but as soon as the corpuscular philosophy became pretty generally received, medicine had her acrimony, spiculae and salts of various sizes. In like manner when astrologers

> took the lead of true science and people began to fancy all terrestial things to be governed by the heavens, some Italian doctor found that this distemper proceeded from the influences of the stars, and gave it the name of influenza. [Robt. Johnson.]

As Sir Thomas Watson says: "they put the cause for the effect."[1] Of these there are several illustrations, but I will name only four.

Buonissegui in 1357 called it, in Tuscany, the *grande influenza* and said that to save the patients the cost of doctor's visits, the doctors were allowed to visit their patients only once daily. Sozoma similarly named the famous epidemic of 1387, while Calenus declared the epidemic of 1579–80 to be *ab oculta coeli influentia.*[4] The fourth illustration is more descriptive: "In 1658, about the end of April, suddenly a distemper arose as if sent by some blast of the stars, which laid hold on very many together, that in some towns in the space of a week about one thousand fell sick together."[7]

The Venetian envoy in London in writing home of the sweating sickness of 1551 used the word *influsso; influxio* and *influsso* were then freely used in respect to all catarrhal and sudoral maladies. *Influsso* is therefore astrological and humoral in its connotations, while influenza is philosophical and astrological but not humoral.[1]

The word influenza was first used in professional English in 1767, in the translation of Professor Huxham's book, "De aere et morbis epidemicis," but the first allusion by an English physician to the word influenza, as the name of an epidemic, was in 1743 in an "Essay on Fevers," also by John Huxham.[4] However, it was not until 1918 that the Royal College of Physicians confirmed the word influenza in the place of Zeviani's *il catarro epidemico.*[1]

Thus we see that very early it was called "pest," "pestilence" or "a plague."[1] Then it was called catarrh in the 16th and 18th centuries, but was called influenza by the Italians as early as 1357; and finally influenza by everyone.

Those are the foremost names of influenza, though its names are legion; varying geographically and temporarilly.

Geographically it was called *morbus Hungarius, morbus Gallicus, suette de Midi, la suette de Picardo,* or the Picardy sweat, which in 1847–48 was thought to be essentially cholera sudorale (Hirsh); in Spain, *pantomima;* in France in 1772, *la fièvre miliare.* In Germany, especially in 1528, it was called the *sudor Anglicus* or the English sweat, or less euphoniously, the *pestis Britannica;* in Russia the Siberian fever, and the Chinese fever in Siberia. America called it influenza Europa, European catarrh or Spanish influenza.[4] Each country was blaming the other for it. It was called Malta fever where the two empires the empire of influenza and the empire of dengue, met.[7]

In 1580 in England it was called the "gentle correction" or later "the Jolly rant," the "Dunkirk rant," or in 1709 the "Dunkirk ague."[4] On account of the symptoms of the 1580 epidemic, the encephalitic forms, which were like those exhibited by a sheep with cysticerci within the skull it was then called *mal de castrone,* and in Germany in 1487 the *Haupweb,* the head trouble, was given as a name for the influenza trailers of the 1580 epidemic. And in 1775 Andral called influenza "hydrophobia without the bite of a dog."[6]

Then there were names given to it on account of some particular symptom. The names *le tac*, meaning a *coup de fer*, and *l'horion*, meaning a sudden punch between the shoulders, are expressed by the Londoner as "getting the knock,"[5] or the "knock-me-down-fever." In Spain it was *trancaze*, a blow with a bar; the *Schnupfenfieber* in Germany and the *mal di castione*, or coughing sickness in Italy. In fact in 1173 it was called *tusso gravessimo.*[19]

The present name for whooping cough, *coquelucbe*, was used by the French for influenza in 1414, 1551 and in the great epidemic of 1580.

That sickness follows as the result of sin was believed not only by the Jews of Christ's time, but by the French in 1411, when they thought that influenza came as a visitation on those for singing a lewd song then in vogue, "Tu as chantē la chanson."[19]

Dengue and influenza were by many supposed to be the same, dengue being the summer form of influenza. (Dengue is by some said to be derived from *dans le dos, le dando.*)[5]

Because the symptoms of influenza did not always correspond to or match the concept of influenza then held, a new epidemic was often thought to be a new disease; for instance Randolph, the English ambassador to the Scotch Court, writing to London in 1562, called it the "new acquanyntance," stating that it "spared neither lorde nor ladye."[19]

Hamer says that different manifestations of the same epidemic used to be thought to be different diseases. For instance, he finds historical records of cases of sausage poisoning in one village, ergotism in a neighboring valley and encephalitis or influenza in a town a few miles away.[1,7] He thinks that all of these cases were influenza.

Again, in 1915, there was in London an epidemic of influenza with lung and cerebrospinal complications that finds its analogy in "a new fever," described by Sydenham in 1685, also with lung and central nervous system symptoms; in each there was often a purpuric rash.[7]

SYMPTOMS

Of the symptoms of influenza Robert Johnson in 1793 said that one of the characteristics of this disease was "the sudden transformation from high health to sickness, often as it were instantaneously." "There is," he says, "no disease to which the human body is liable that is so extensive in range, so sudden in attack (the German *Blitzkatarrb* or lightening catarrh carries out that idea) and so furious at the beginning, so rapid in its course, and at the same time attended with so little danger."

Time permits of speaking only briefly of some of the symptoms.

The cough is especially prominent for its persistence, especially as a sequela. In 1410–11 in Paris, it was so severe as to cause in some cases rupture of the pregnant uterus.[19] In the epidemic of 1427 it prevented the people from attending church; but from the contemporaneous writings we learn that it did not prevent them from attending the theater.

Epistaxis was noted by Hippocrates and was regarded as a favorable symptom in the epidemics of 1414, 1580, 1729 and 1837. It was frequent in recurrence rather than persistent, in the epidemics of 1737, 1755, and 1803, and, in the 1918 epidemic, was noted by Conner in 25 per cent of cases in some hospitals, especially in the cases that later developed pneumonia.[14] Johnson in 1793 mentioned a patient who lost 20 ounces of blood.

In 1580, on account of coincident symptoms referable to the bile duct, that epidemic was called by some *catarrhalis biliosus.*

Sometimes there was a bloody sputum[11] and cyanosis, the mauve or heliotrope cyanosis that was so fatally characteristic.[10] Some of these cases of cyanosis in the Russian epidemic of 1742–43 terminated in diarrhea or dysentery, which seems to show, in the terminal stage of the case, an affection of the vegetative nervous system innervating the gastrointestinal tract, as there was in the early stage a disturbance of the vago-autonomic nerves supplying the lungs. This affection of the vegetative system will be referred to later.

Diarrhea, pneumonia and rhinorrhea, a great flux from the nose, were noted in 1693.[11] Webster, in 1761, noted a running from the nose and Heimer in 1762 noted it as the cause of erysipeloid irritation of the upper lip.[14] Fernel, Benedetto and Ballonius regarded the catarrh as a distillation from the brain which came as a sweat, a flux, of the mucous membrane and which, if repulsed or arrested, choked the nervous system, producing what we now call encephalitis or myelitis.[6]

Camerarius in 1712 observed ptosis, the *oculi semi apertis,* a prominent symptom of the present-day cases.[10] That was the epidemic that he called *Schlafkrankheit* on account of the sleepy appearance.

Jelliffe advances an unique hypothesis in relation to causation of the symptoms. He says that, the involuntary functions of the body being under the opposing control of the sympathetic and the parasympathetic systems, an inhibition of one means an increase in the activity of the other. He also says that the most striking general feature of this autonomic or parasympathetic predominance is that bearing upon the complex factors of vascular wall function. As the result of the paresis of the constrictor fibers there is a dilatation of the vessels and a serous or hemorrhagic exudate.[11] If cephalic there is pain in the head, a serous or non-purulent meningitis (the "hydrophobia without the bite of a dog"). The head pain is at times intense, of a bursting character.[11] If the cranial nerves are involved there may be disturbances of smell, optic neuritis, ocular paralysis, deafness, vertigo, disturbances of taste, facial palsy and various fifth nerve neuralgias. Or, if peripheral spinal nerves are involved, we get neuritides or neuralgias from exudations in the nervi vasorum of the nerve sheaths.[11] In Scotland (and it is strange how symptoms occur to suit the people) there was a most characteristic sensation of tracheal excoriation that the imbibing of Scotch relieved. All of which, to go back to Jelliffe's explanation, are due to a vegetative disturbance, the most striking features of which are the disturbances of the pneumogastric and sympathetic adjustment. The sympathetic paresis with over-action of the autonomic causes the edematous flooding of the pure "influenza pneumonia," the pneumonia being thus not a complication, but a part of the disease.

The gastrointestinal symptoms from this vegetative disturbance are gastrosuccorrhea and the like.

COMPLICATIONS

The complications are many. Some are of interest.

In the throat there is sometimes a marked difference between the objective symptoms and the subjective symptoms, for at times, when there is little that can be seen, there is much subjective complaint, or vice versa.[14] Hoarseness and cough were prominently noted in the Roman epidemic in 1593, also in the epidemics of 1673, 1712 and 1737. Sometimes there occurs a paresis of some of the intralaryngeal muscles.[14] Years ago such a case was diagnosed in Charleston. The child's father thought that the condition was due to tuberculosis and moved to another city, changing the outlook and surroundings of his family.

Anosmia, if associated with disorders of taste, is apt to be permanent. Sinusitis occurs in 4–6 per cent of cases, but it tends to recover, even without treatment, in marked contrast with mastoiditis, which is serious, even with treatment. Middle ear complications were noted in the epidemics of 1580, 1732, 1788, 1789 and 1835, and it was early recognized that the eustachian tube caused the middle ear complication. H. Lawson Whale makes the interesting observation that an influenza mastoid may occur without an intervening middle ear involvement.[14] The epidemic of 1733 was noted for giddiness, an internal ear involvement.

Intracranial complications from otitis were early noted. Frances II, King of France, husband of Mary of Scotland, had an intracranial complication, a condition then recognized as due to the discharging ears (Alexander Dumas).

Neuralgias and neuritides with palsies and zosters[14] of every regional distribution, central as well as peripheral, have been seen.

Pregnancy has always been noted as one of the most serious complications, for it has been noted that a temperature of 103°F. or more, or especially a cyanosis, is particularly apt to make a uterus become active, and if abortion or premature labor occurs the mortality was as high as 80 per cent (Titus and Jamison) or as low as 50 per cent.[15] As has been mentioned, cough may cause the uterus to rupture. In 1510 women often aborted. In 1647 it was especially fatal to pregnant women. In the 1782 epidemic there were in London "many cases of miscarriage and some deaths."

Bradycardia is frequent in the early stages from involvement of the synapses in the mid-brain, and of the cromaffin tissues. Glossopalatine or spinal accessory involvement manifests itself as taste disturbances and a general disgust for food. This was especially noted in the 1742–43 and 1780 epidemics. Sciatica is also extremely common, being mentioned by many authors.[11]

CONCEPTS OF DISEASES: EPIDEMICS AND EPIDEMIC CONSTITUTION

As physicians we observe the phenomena presented by the patient. We then express their order of occurrence and their likenesses by means of concepts. The formation of a concept is not an act of perception but is an act of the mind. A disease concept, therefore, is a mental act and is as immaterial as an Euclidian line, but the disorders of function, their manifestations and their results, as attributed to the patient, are realities. Disease concepts are not realities but are bills of exchange on the counting house of medical practice, to be cashed, discounted, or rejected in accordance with their value at the current rate of the bank of medical experience. A disease like influenza has no existence, except at most in the Aristotelean sense, anterior to the concept; just as a lawyer considers that a crime is only a crime as a result of a law. Anterior to the law the crime does not exist.[2]

We give a name to the disease concept, calling it scarlet fever, measles or influenza. When we match the symptoms presented by the patient with the disease concept we make our diagnosis and the patient is said to have a case of the disease. As we learn more, observe more and better, our disease concept changes. Because influenza did not match with the disease concept held at various times, influenza was frequently called a new disease; as a new delight, a new acquaintance, *morbus novus*, and *morbo neuvo* or *morbus insolitus*. New concepts mean new symptom groupings and rearrangement of our ideas concerning the manifestations of certain classes of sick persons. Just as a disease is a concept of symptoms plus an intracorporeal cause, so an epidemic concept is a concept of cases plus an extracorporeal cause, and a pandemic concept is a concept of epidemics plus an extracorporeal cause.[3]

We refer symptoms to the disease concept for diagnosis. We refer cases to the epidemic concept for diagnosis and we refer epidemics to the pandemic concept for diagnosis. The sufferer from the *epidemy* is not the person who harbors the disease but the community within whose terrain play the agencies that disseminate the germs and favor their pollulation; and the cause relates rather to the population and to the prevalence. As Brochin says: "Dans les epidemies, bénignes ou dangereuses, il ne s'agit pas d'un homme, mais de la cité, et même de tout un pays. Civitatem non virum curabis."[3] Epidemiologically we think of cases as symptoms of epidemics, and of epidemics as symptoms of pandemics.

EPIDEMIC CONSTITUTION

The epidemic constitution was philosophized about by Hippocrates; idealized by Galen and materialized by Bellonius in the 16th century in his book called "Epidemies and Ephemerides." Sydenham practiced clinical analysis and epidemiological synthesis.

The epidemic constitution may be described as follows:

There appear many cases in a community which are often attributed to local conditions; as food poisoning (canned tomatoes, ergotism, botulism), drain errors, overcrowding, or rhaphania. Some of these may be nervous cases as solanism or they may be some form of meningitis. There are interesting and unusual forms of cerebral, bulbar, spinal and neurotic diseases. There are also respiratory cases which are diagnosed as pneumonia of a peculiar onset and course.

Others are gastrointestinal in their manifestations and have, as a diagnosis, some form of enteric fever, as typhoid, dysentery or gastric fever. There are also cases of gastroenteritis and of colitis (the scorbutus of the Renaissance period), or there is the serous effusion in the peritoneal cavity, "the tumid belly," as it was diagnosed by Sydenham, as a part of the epidemic constitution; or cases are seen of anomalous or peculiar forms of common specific fevers or of septic throat, of the fourth disease, of lastrim, of glandular fever and the like.[17]

"Many diseases appear new and mysterious and puzzling. Even the lower animals are affected, domestic as well as wild." These conditions succeed one another for a year or two or more and should be called by epidemiologist the *avant coureurs*. At this time the epidemic is often not looked for.

> Then comes the general widespread and evident general disturbance of public health, a perfectly recognizable manifestation. In the pre-pandemic period the endemics and epidemics are less typical but become more typical as the pandemic period is approached and less typical after the pandemic ends. During the pandemic or "the influenza crisis" much happens that is afterwards forgotten. For instance; surgical operations "go wrong." There are odd forms of suppuration or peculiar inflammations of veins and of cellular tissues are seen with unusual frequency; anesthetists meet with difficulties; obstetricians have calamities; aural and ophthalmic specialists are puzzled; and alienists are consulted concerning baffling and strange psychoses.[17]
>
> Moreover, the veterinary surgeons are busy; for there are epidemics here and there among horses, dogs, cats and rabbits and fowls; and paralytic affections such as "limber neck" are common in the stable and in the farmyard. [cf. Heusinger.[7]]
>
> Nor is it only the domestic and captive animals that suffer; for, as in 1918, we heard of reindeer in Labrador and Lapland, and baboons at Gibraltar and the Cape dying mysteriously and in great numbers. And again there is indisputable evidence that during the great influenza periods there are widespread changes in the world of insects, of vegetables and of fungoid life.[17]

This fact is brought out in the etiology of influenza, as related to birds and in the Argive Camp where dogs and cattle were affected.[19] In 1833 influenza was called epizootique.

"Then the influenza pandemic all bubbles down as trailers, which in each succeeding year become more unlike the pandemic."[7]

Thus an epidemic constitution is not a material thing like a flower or vegetable; it is a concept of a condition, and by comparison of our observations with that concept a diagnosis is made of an epidemic constitution. An epidemic constitution, is, therefore, seen to consist of (1) the *avant coureurs*, (2) the pandemic, and (3) the trailers.

That brief exposition of an epidemic constitution may to some seem like a meaningless theory, but as a case in point, this is the epidemic constitution of the 1889–90 pandemic.

There were, according to Menitier, avant coureurs in the form of pneumonia in Paris in 1885; followed, according to Cordier, by an outbreak of poliomyelitis in France in 1886; and the same malady in Norway also in 1886, reaching Sweden in 1887–88. In the Mediterranean in 1888 it was called a "new disease" and according to Marathner, manifested itself as a disease similar to the Heine-Medin disease in Geneva and as a new form of pneumonia in Italy in 1888; in Virginia it was also called a new disease; some thought it to be dengue. In the Near and Middle East it was a vast epidemic, locally recognized as dengue, and the "dengue" at Honkong in September and October, 1888, was diagnosed by Sir James Catlie as true epidemic influenza. It was traced to Cairo, Palestine and Constantinople, then to Spain in 1889, as a new gastric and yellow fever; and also in Rio de Janeiro, as reported in the *Lancet*, it occurred as a new and comatose fever; in Germany as poliomyelitis; in Russia as rhaphania, now called encephalitis lethargica. Then the trailing epidemic of poliomyelitis following in 1890–95.[17] It is of interest to note how many times it was called a "new disease." Crookshank described the epidemic constitution of the 1918 pandemic:

> It may, in a word, be said, that if the epidemiological happenings during an influenzal constitution be analyzed, we find that we may consider them as forming a series or sequence of epidemics grouped around a pandemic diffusion of the classical type. Influenza, then, is not the name of a specific disease and nothing more, but it denotes and must denote a complex concept, which essentially resembles in its construction the concept, for instance, of war. And, just as the notice of special wars, associated campaigns, battles, skirmishes and hand to hand encounters are embraced in the greater concept of war itself, so our notions of influenza embrace the subsidiary and constituent notions of certain kinds of epidemics, outbreaks, foci, and cases, and even of single symptoms such as epistaxis and hiccough.

In 1928–29 there were many cases of recurrent epistaxis and of low blood pressure from affections of the chromaffin, "which are of vast importance when studied from the viewpoint of the happenings with which they may be associated."[17]

All words, merely words, say some, but the account given by Quidetti of the epidemic constitution of 1712 parallelled word for word, as to some of the passages, with that in London in 1918.[6] The past checks with the present.

Mortality and Incidence

As has been said, influenza is a disease with an enormous morbidity and a relatively small mortality.[19] There have been exceptions to this, as in 1918; and in 1647, when in the Barbadoes and St. Kitt's there died 5000 and 6000 respectively. The most fatal complications are pneumonia,[19] and pregnancy.

As to incidence of infection, that also varies, but is generally high. In 1323 "all in Florence, Italy, were affected." In 1510 "not a family and scarcely a person escaped." In 1729, in Lausanne, 2000 of the 4000 inhabitants were sick and "in Plymouth, England, and district, not a house on the average was free." In Edinburgh in 1758 "not one in seven escaped." In 1410–11 Pasquier says there were at least 100,000 cases in Paris.[19]

But, for instance, in 1410–11, "except for cases with chronic disease and *que venesectione sunt*, hardly one in 1000 of those attacked died" (Weims). The excessive mortality of the earlier epidemics was due to the inordinate passion for venesection.[19] This may also account for the 20 to 60 per thousand mortality in Eulenburg in 1729. In 1510 bloodletting in Italy was followed by fatal results. Bleeding and purgatives are now said to have been injurious, but in 1580 in Italy and Spain bloodletting was practiced with dire results, killing 9000 in Rome (Schenkius) and depopulating Madrid and Barcelona (Vollalba). "Nearly all those who were bled died" (Saillant). In 1742–43 venesection caused many deaths in Italy as in previous epidemics.[19]

Andral thought influenza was itself never fatal, the deaths being due to secondary disease, or, I may add, to the treatment. The epidemic of 1833 was thought by contemporary writers to owe its high mortality to complications and sequelae and not to the disease.[4] But in 1847–48 the capillary bronchitis was very fatal, and in 1918 the mauve or heliotrope cyanosis was particularly indicative of a fatal termination, even though the other symptoms then present did not appear serious. This symptom and its prognostic value were referred to by Peacock as early as 1847.[10]

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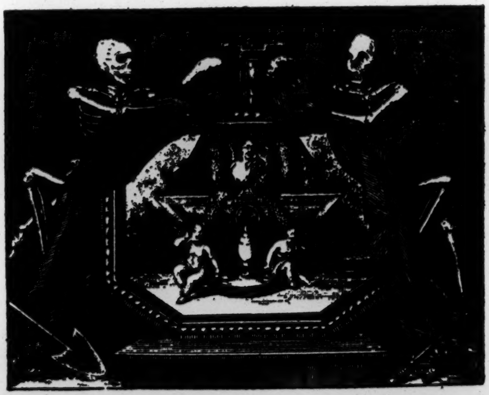


[Cowper: Anatonia Corporum Humanorum. Utrecht,1750]

GRAEFENBERG, THE SHEPARD FAMILY'S MEDICAL SCHOOL

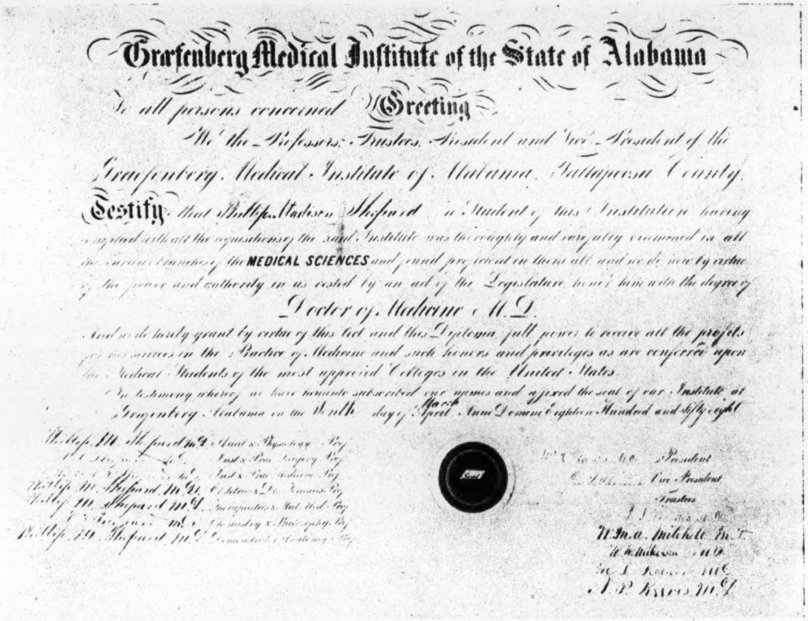
By ROY H. TURNER, M.D.

NEW ORLEANS, LA.

ALABAMA'S first medical school was a family institution. It was located in an isolated rural community which only a few years before had been the hunting ground of Indians. The story of the school and its founder throws light on a distinctive period in American history, the medical, social and economic aspects of which were characterized by unbounded energy and enthusiasm but frequently by total disregard for sound principles. It was a period dominated by the spirit of the pioneer, who is justly renowned for his courage and determination, but whose lack of cultural and scientific background was responsible for many unsound and sometimes ludicrous ventures.

Philip Madison Shepard, founder and proprietor of the Graefenberg Medical Institute, was born in Columbia County, Georgia, in 1812. His father was Philip Shepard and his mother Sarah Briscoe. When he was still a small lad the family moved to Walton County to make a home in the unclaimed forest. When he was thirteen years old his father died, leaving him chiefly responsible for the support of his mother, brother and four sisters. There was a debt on the farm, which was only partially under cultivation. Five years of backbreaking toil followed, farming the rough, stumpy fields and clearing away the woods for new fields. Before his father's death young Shepard had attended school for a few years in Columbia County and with that meager training determined to add to his education by studying during such moments as he could find. From the age of thirteen to eighteen he studied in the evenings and found, as so many ambitious youths have, that the fatigue of prolonged manual labor is a fearful handicap to study. His desk was a crude plank nailed to the wall of the cabin, lighted by a torch of lightwood. His fatigue was so great that he frequently fell asleep at study and not infrequently the torch set fire to his desk. For one summer he taught school, with indifferent success. He joined two militia companies, one of cavalry and one of infantry. When he was nineteen his mother married a Mr. Banks, and the union proved a happy one. Young Shepard was thus released from the heavy responsibility of the care of the family and was allowed to further his own career.

At twenty-one he began the study of medicine with a local practitioner, Dr. John B. Boon, of Social Circle, Georgia, staying with him eighteen months. He was on the point of beginning practice on his own responsibility when someone furnished him with sufficient money to enable him to enter a medical school. He walked the 125 miles to Augusta, where the Augusta Medical College had been founded the year before. After the four months' term he returned to Social Circle and practiced until late autumn. During this summer he was kept extremely busy due to the prevalence of malaria in the community. He returned to medical school in the fall for his second and final session "much emaciated and his liver much distressed by predisposition to malaria, so much that for two months he was very sick." Professor and Mrs. Ford took him into their home and cared for him as for a son. He then recovered from his malaria and the profound depression of spirits which accompanied it. Dr. Ford was then Professor of Chemistry and Pharmacy and was later Dean of the school and the first president of the Georgia State Medical Society. As dean he submitted to the other medical schools of the nation the now famous invitation to join in conference for the purpose of raising standards of medical education, which was unfortunately largely ignored.



Græfenberg Medical Institute of the State of Alabama

To all persons concerned Greeting

We the Professors, Trustees, President and Vice-President of the Graefenberg Medical Institute of Alabama Tallapoosa County

Testify that Phillip Madison Shepard a Student of this Institution having complied with all the requisitions of the said Institute was thoroughly and carefully examined in all the various branches of the MEDICAL SCIENCES and found proficient in them all and we do hereby by virtue of the power and authority in us vested by an act of the Legislature confer on him the degree of

Doctor of Medicine M.D.

And we do hereby grant by virtue of this act and this Diploma full power to receive all the profits for his services in the Practice of Medicine and such honors and privileges as are conferred upon the Medical Students of the most approved Colleges in the United States

In testimony whereof we have hereunto subscribed our names and affixed the seal of our Institute at Graefenberg Alabama on the tenth day of March April Anno Domini Eighteen Hundred and fifty eight

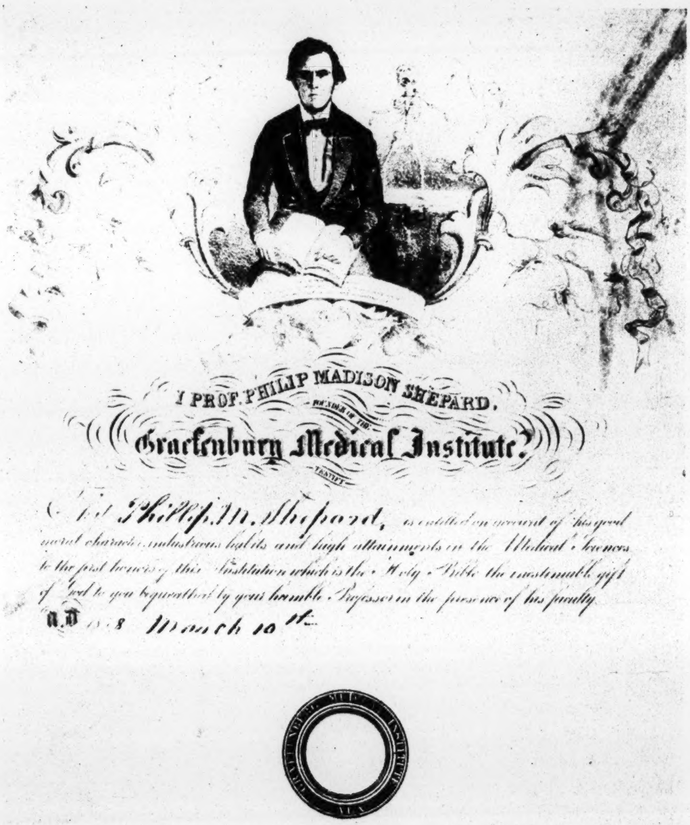
Phillip M. Shepard M.D. Anat & Physiology Prof
[illegible] M.D. Inst & Prac Surgery Prof
[illegible] M.D. Inst & Prac Medicine Prof
Phillip M. Shepard M.D. Obstetrics & Dis. Women Prof
Phillip M. Shepard M.D. Therapeutics & Mat. Med. Prof
[illegible] M.D. Chemistry & Philosophy Prof
Phillip M. Shepard M.D. Demonstrator of Anatomy Prof

[illegible] M.D. President
[illegible] Vice President
Trustees
J. T. [illegible] M.D.
Wm. A. Mitchell M.D.
W. H. Wilkerson M.D.
M. L. [illegible] M.D.
A. P. Kerrs M.D.

FIG. 1. DIPLOMA ISSUED TO PHILLIP MADISON SHEPARD, JR. THE FACULTY SIGNATURES ARE THOSE OF HIS FATHER AND OLDER BROTHER. THE PRESIDENT, W. L. BANKS, WAS A HALF-BROTHER OF THE FOUNDER OF GRAEFENBERG AS WAS ONE OF THE TRUSTEES, J. T. BANKS. M. L. FIELDER, ANOTHER TRUSTEE, WAS HIS WIFE'S COUSIN.

In February of 1835 Shepard graduated, one of a class of fifteen, and being entirely without money he walked the 125 miles back to Social Circle, "the proudest man living, with his sheepskin." He resumed his practice there and the following February he was married to Miss Louisa Fielder, of Social Circle. A few weeks later, as a private in the Walton Cavalry, he was summoned for duty in the Seminole War, which "placed him under very unfavorable circumstances." Retaining his rank as private in the cavalry troops, he was assigned as assistant to the Battalion Surgeon, Dr. Bailey. Though he apparently took no part in any engagement with the Seminoles, there was much sickness among the troops and he was busy enough for the few months of the campaign. The following year his first child, John, was born. Not long afterwards he moved with his wife and baby by wagon and horseback 100 miles to Lafayette, Alabama. He was attracted to Alabama by the amazing prosperity of that state, which was based on cheap land recently taken from the Indians and upon an inflated state currency. The remaining Creek Indians of that section had threatened serious trouble during the Seminole War in 1836, whereupon they were sent West. The trouble initiated by the Seminoles has been recorded by two other young physicians, Sims and Wooten, who were making Alabama their home and who were later to acquire distinction in their profession.[1,2]

During the eight years in Lafayette, in addition to practice, he prepared a group of young men for medical college and did dissections. He became involved in medical debates with other members of the profession, "consequent upon his strenuous advocacy of certain new theories relative to Inflammation, Congestion and Cause of Fevers, etc." Although he is said to have been victorious in all these debates, he found it advisable to move to Wetumpka. There a group of physicians were securing a charter from the State Legislature for the Alabama Medical University. The



I PROF. PHILIP MADISON SHEPARD.
PRESIDENT OF THE
Graefenburg Medical Institute,
TESTIFY

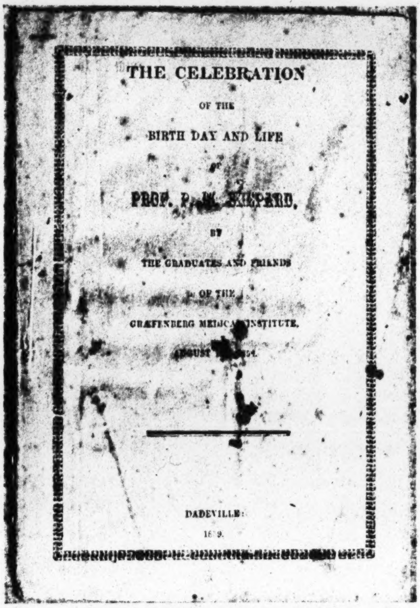
that Phillip M. Shepard, is entitled on account of his good moral character industrious habits and high attainments in the Medical Sciences to the first honors of this Institution which is the Holy Bible the inestimable gift of God to you bequeathed by your humble Professor in the presence of his faculty

A.D. 18 8 March 10th

FIG. 2. HONOR CERTIFICATE AWARDED TO PHILLIP MADISON SHEPARD, JR. BY HIS FATHER, WHOSE PORTRAIT IT SHOWS. THIS CERTIFIES THAT THE GRADUATE HAS BEEN AWARDED A HOLY BIBLE.

school never functioned and he remained there only one year, removing in 1846 to the nearby village of Dadeville, Alabama, on the fringe of which he settled. Here he was to live and work for the remainder of his life. Dadeville was a village of 700 people, just incorporated, in the Piedmont section of Tallapoosa County, East Alabama, lying midway between the other two towns in which he had lived. In cultural matters and interest in education the community was far ahead of the usual village in the Alabama hills.

Flush times had been succeeded by depression; the young physician's health was poor, his family large, his property small; his discouragement was intense. His wife was probably a large factor in sustaining his spirits through this trying period. She had in ten years borne six children, had moved, with a young baby, in a wagon over roads sometimes little more than trails, had as a young mother ridden a horse daily to school in order that she might be properly educated to be the partner of her ambitious husband. Her health was robust, her courage and resourcefulness unfailing. Her grasp of business matters served a particularly good purpose, since her mate was gifted more with imagination and enthusiasm than with cool business judgment. Fertile land was purchased and cleared, a house built and profitable farming was begun. Few rural physicians of the South of that time limited their gainful activities to the practice of medicine. Bassett, Osler's "Alabama Student," a contemporary of Shepard, estimated the average annual income of the physicians of his county at $1000. However, in a community like Dadeville, where the most influential citizens were slave owners, it was socially hazardous for a professional man to do manual labor, though the large number of white families who worked small farms tended to counteract such aristocratic influences. Dr. Shepard did not hesitate to take axe in hand and clear land, nor to plow fields, as he did in his earlier days. However, this was done with as little publicity as possible. Callers at his office were sometimes allowed to conclude that his absence was for professional purposes when he was actually working as a laborer a short distance away. Many calls were delayed until after the day's work in field or forest had been done, when homespun work clothes would be exchanged for formal professional attire and a ride of several miles on



THE CELEBRATION
OF THE
BIRTH DAY AND LIFE
OF
PROF. P. M. SHEPARD,
BY
THE GRADUATES AND FRIENDS
OF THE
GRAEFENBERG MEDICAL INSTITUTE.
AUGUST [illegible]

DADEVILLE:
1[illegible]9.

FIG. 3. FRONT COVER OF BOOKLET WHICH CONTAINS PHRENOLOGICAL SKETCH AND BIOGRAPHY OF DR. SHEPARD AND ADDRESSES BY DR. SHEPARD AND SEVERAL OF HIS ADMIRERS. VERY FEW COPIES OF THIS PUBLICATION ARE IN EXISTENCE. (COURTESY OF ALA. DEPT. ARCH. & HIST.)

horseback would bring the weary physician to the patient's bedside. Prosperity was the reward of such industry. Prosperity to Dr. Shepard meant opportunity to put into effect at least a few of the many schemes constantly running through his mind, schemes chiefly educational and concerning schools of various kinds.

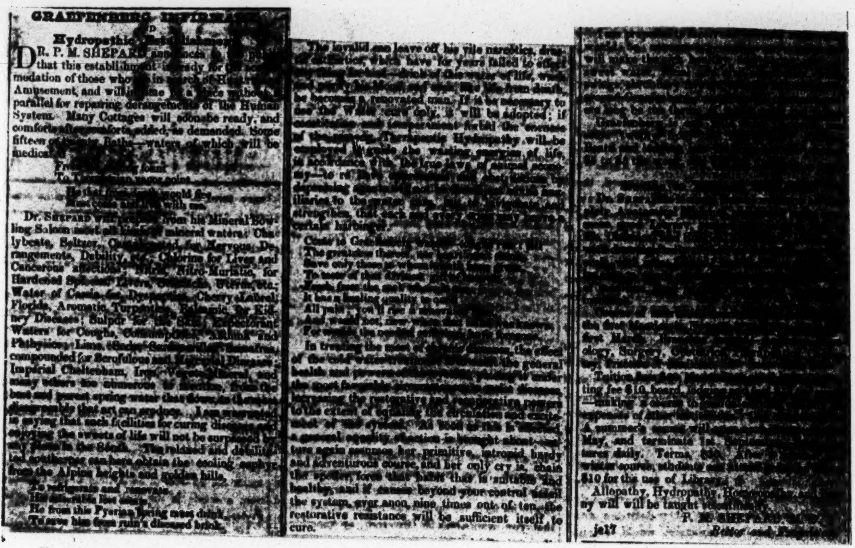


FIG. 4. REPRODUCTION OF ADVERTISEMENT APPEARING FROM JUNE 21 TO OCTOBER 2, 1851, IN THE *Advertiser and State Gazette.*

In the summer of 1851 advertisements in the state's outstanding paper, *The Advertiser and State Gazette,* of Montgomery, announced that Dr. Shepard's Infirmary was ready for patients and that his medical school would soon be ready for students. A few months later, February 7, 1852, the State Legislature granted a charter to Dr. Shepard and three other physicians as trustees for the "Graefenberg Medical Institute of the State of Alabama."[3] Dr. Shepard was listed as "proprietor and professor." The graduates of this Institute were to be entitled to all the "privileges accorded graduates of leading Medical Colleges." The charter directed that report as to the condition and progress of the school be made to the Legislature every two years. This report was later utilized as an opportunity to request a grant of state funds. Cottages had been built for the infirmary and a large building was soon constructed to house the various educational institutions he founded; first the Medical School, then the Winston Male College, which was chartered in 1858.[5] Application was made for a charter for the Octavia Walton Lee Vert Normal College for Young Ladies in 1860. The bill granting charter to this last institution passed the State Senate only,[6] but the school was in actual operation at that time. These schools were named for their principals, though they were the property of Dr. Shepard, who shared trusteeships with his two older sons. Many branches of learning, ornamental and useful, flourished under one roof. Graefenberg was the scene of great activity; commencement exercises for the different classes or schools were held at various times during the year; there were concerts and oratorical contests which drew great crowds. The Winston Male College had a military department for which the government furnished muskets and one cannon.[5] Military drill aroused much interest and enthusiasm. Probably the source of greatest public interest was the public examinations conducted by the Board of Trustees or their representatives, which determined fitness for graduation. The medical candidates were submitted to a public examination lasting "three days and nights," during which five thousand direct questions were said to have been propounded.[7] This figure was the estimate of one who had been through the ordeal, the terrors of which may have caused him unconsciously to exaggerate.

In 1858, on the occasion of Dr. Shepard's forty-sixth birthday, his pupils and admirers held a celebration. The speeches of the occasion, together with a biographical and phrenological sketch, were published in a booklet.[7] The occasion and the publication were used for the shaping of public opinion toward furthering appropriation of state funds for the support of the medical school. The Professor was not indifferent to the advertising value of the occasion for drawing students. This little pamphlet is the most important source of information we have concerning the founder of Graefenberg. The laudatory biographical sketch is obviously the work of Dr. Shepard, though written in the third person.

For the first three years of the school's existence the founder did practically all the teaching alone, although there were other members of the faculty, all apparently relatives, who did little teaching but were useful in signing diplomas. In 1855 he graduated his oldest son, John, who was added to the faculty at the age of eighteen. Three years later, when he was twenty-one years old, he held two professorships alone and shared one other with his father. Philip Madison, Jr., was graduated in 1858 and joined the faculty. From the time John was added to the faculty this body was apparently composed entirely of father and sons. In 1860 the founder occupied three chairs himself and shared two others with the younger son, while the older son held two professorships. In 1860 the third son, Orlando Tyler, was graduated at the age of seventeen and became Professor of Obstetrics and Diseases of Women and Children. He is said to have officiated at childbirth at the age of fifteen.

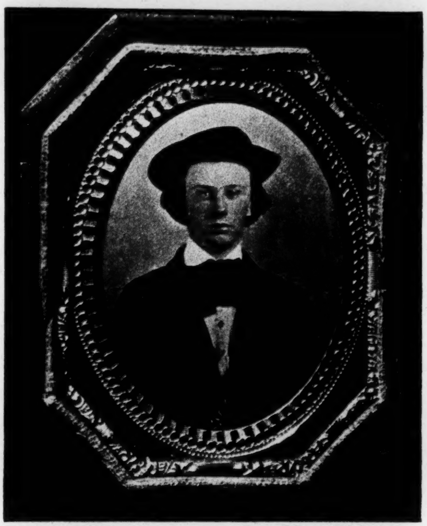


FIG. 5. DAGUERREOTYPE SHOWING PROFESSOR TYLER SHEPARD AT THE AGE OF TWENTY, THREE YEARS AFTER HE HAD BEEN MADE PROFESSOR OF OBSTETRICS AND DISEASES OF WOMEN AND CHILDREN.

One of Dr. Shepard's children who graduated at Graefenberg was not made a member of the faculty. His daughter Louisa, the third child, took the same training as her brothers and was awarded the degree of Doctor of Medicine. She was the first woman to be awarded this degree by a southern medical school. Public opinion discouraged her taking up practice; she married, moved to Texas and reared a family.

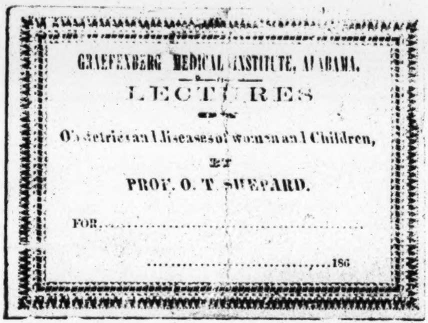

GRAEFENBERG MEDICAL INSTITUTE, ALABAMA.
LECTURES
ON
Obstetrics and Diseases of Women and Children,
BY
PROF. O. T. SHEPARD.
FOR..
....................................,...186

Fig. 6. Ticket Necessary for Admission of Student to the Lectures of Professor Tyler Shepard.

In April, 1861, a bedside clinic was held in a cabin of a sick negro woman not far from the campus. The Professor's diagnosis was peritonitis and the prognosis grave. The patient died and was buried. Other physicians who had seen her gave out an entirely different diagnosis. Dr. Shepard's pride was aroused. Permission was obtained, the body exhumed and autopsy performed before the class beside the open grave. Signs of generalized peritonitis were found, to the Professor's gratification. In performing the autopsy he cut his finger; a few hours later he had a chill and soon developed evidences of septicemia and in a few days was dead.

His death occurred just as the Civil War broke out. Either catastrophe was sufficient to snuff out the life of the little medical school, which had been maintained in such an unnatural rural environment at great cost of enthusiasm, energy and sacrifice of standards. The youngest of the three sons who were members of the faculty was known as Dr. Tyler. He laid aside his duties as Professor of Obstetrics and Diseases of Women and Children to become bugler in the escort of Gen. Joseph E. Wheeler. It is not known whether the failure of the Confederate Government to utilize his medical training was due to the nature of his specialties or to his youth, most likely to the latter. Philip Madison, Jr., served two years in the Confederate Army as a cavalryman. John did not enter military service, for though only twenty-four years old, he had a large family and his services were more needed in the community. He already had a reputation as an able physician, and before his death was considered the greatest physician of his time in that portion of the state.

For many years after the war it was the dream of these three sons and of the fourth son, Joseph, whose education after the war was relatively elaborate, that Graefenberg should be rehabilitated, but the extreme poverty of the community during Reconstruction days prevented. In 1873, twelve years after the school had closed, the building burned, with it the library, anatomical museum and school records. Four sons of the founder of Graefenberg, three of them trained entirely by their father, continued to practice medicine in the community and were highly respected physicians. Among their descendents are a number who have through exceptional ability acquired distinction in various fields. Only one of their descendents entered medicine and his career was cut short by early death.

Accurate information concerning the Graefenberg Medical Institute is far from complete. We know that it was recognized as a full-fleged medical school, functioned from 1852 to 1861 and graduated about fifty physicians. The sessions were four to five months in length, frequently two sessions being held in one year. The entrance requirements were very lax and one session qualified for graduation. Total expenses for a session including board, washing and lodging, "Diploma and Honor," were $135 to $145. The tuition fee was regularly $60, but bargain rates were common, especially during the summer session when the fee was cut to $30 or $40. If a student failed to graduate at the end of one session he was allowed to repeat by payment of the library fee of $10. The students lived in an annex to Dr. Shepard's home and they had their meals with his family. The library was composed of encyclopedias and textbooks and a few journals. There were cadavers for dissection, kept in large metal lined vats, and several skeletons. There were a garden in which medicinal herbs were grown and a pharmacy in which medicines were compounded. Certain chemical apparatus was available for simple demonstrations. All these were housed in a large three story frame building which also contained the auditorium and class rooms for the owner's various schools. The cadavers are said to have been obtained by grave robbing, by an occasional execution of a criminal, and by importation from Montgomery and New Orleans. Years after closing the school the older sons of the founder delighted to send shivers down the spines of listeners gathered at night about a smouldering fire by describing adventures of grave robbing or transportation of bodies from the railway station twenty miles away, all of which work was done at night. The teaching was largely by lectures and quizzes; the founder loved lecturing and in his enthusiasm he was likely to pitch his voice higher and higher until it became a scream. There was bedside teaching, however. In the six cottages making up his infirmary there were a few patients who were sometimes used for clinical teaching. These patients were nursed by their own relatives or servants. It was not an uncommon thing for the professor to take his small class to the bedside of a patient several miles away, each riding a horse. Bible study was included in the curriculum. An alumnus said, "Here we have nothing but one unceasing round of study and review day and night without the thousand and one temptations and inducements to vice and immorality always incident to a large city."[7] In 1860, when Dr. Shepard was trying to get financial help from the State Legislature, the influential and aristocratic physicians of South Alabama who made up the State Medical Association demanded that the state establish a first class medical school at Mobile, the largest city in the state. They pointed out quite clearly the necessity of having a medical school in a city.[8] Dr. Shepard replied by pointing out not only the moral safety of his medical students but also their safety from devastating epidemics of yellow fever and cholera to which Mobile and New Orleans were then subject.[7]

Some of the graduates of Graefenberg later obtained degrees from other medical schools. However, it seems that most of the graduates entered practice without further training. A special committee of the American Medical Association reported on the licensing laws of the nation at the meeting in Boston in 1849[9] and was particularly harsh with Alabama, stating that quackery so flourished as to destroy all respect by the public for the real medical profession. This was apparently a gross exaggeration. The Alabama State Medical Association was vigorous in its protests of injustice of the criticism. However, the fact remained that possession of a diploma from a legally chartered medical school made it unnecessary to stand examination before the State Board of Medical Examiners.

Fevers were the great problems of the medical profession in Shepard's day. In 1850 the physicians of Alabama were just beginning to learn to distinguish clinically between the various forms of malarial fevers, "intermittent, remittent and congestive," and typhoid fever. Malaria was the biggest problem of all. Just how serious its ravages were in Alabama may be appreciated from reading the experiences of Marion Sims,[1] who lived sixty miles away. He saw families practically wiped out by the disease in 1836 and also in 1840.

The modern is dismayed at the extreme vigor of the therapy of that day. In 1858 Dr. Shepard recorded the treatment he gave his malaria patients in 1834 and he seemed still to approve of it.

> A cursory glance at his practice may do some good, particularly to those who are very timid, he is not and never was a temporizer in the practice of medicine, we have reference to that season; Emetics when no gastric disturbance, blood-letting where there was the slightest congestion, . . . and would place from two to four mustard plasters at a time, to remain one hour, until he has been known to use as many as ten, very generally eight, . . . if slight remissions, barks and snakeroot, during febrile exacerbation the shower bath, from 10 to 30 gallons of cold water, the patient well wrapped in blankets . . . whenever he used calomel about one large dose, 10 to 100 grains, and let his patients have at all times what cold water they wanted.

The last statement provides the only cheering feature of a terrifying picture. During the particular time he was describing in 1834 the value of quinine in the treatment of malaria was not generally appreciated, although isolated fifteen years previously, and although physicians here and there were using it effectively.[10] Neither was chincona bark properly used nor appreciated by the general profession then. It is disappointing that he made no reference to quinine when the quotation above was written in 1858, when quinine had been accepted as specific for malaria and the leaders of the southern profession had even decided with great reluctance that it was of no value in the treatment of typhoid and yellow fever.

Inspection of the various medical journals published in the South during his time did not reveal any article by Dr. Shepard. Although one of his graduates, Dr. C. S. Reeves, gives him credit[7] for proposing and setting on foot the Medical Association of the State of Alabama, he was never a member.

Many of Dr. Shepard's outstanding characteristics seem strikingly modern. He was a self-made man, with most of the virtues and faults of that genus. He rose from poverty with the aid of little in the way of formal education to a position as head of three educational institutions, of his own creation. He was a believer in action: "There is no pleasure in unvarying rest, our enjoyments must spring from action, as the body can only be braced by labor, so can virtue, knowledge and intelligence be strengthened by exercise, use or labor." His crude motto is still more expressive:

Lays on with all his might and never doubts,
Every lick well laid on will find something out.

His life was full of restlessness, change, struggle. His diction is that of a man of inadequate schooling; his sentences seem to have been written on the run and never revised. He was out of sympathy with the aristocrats of his day: "Much of this disposition now being cultivated by us is too aristocratic, favoring mostly to noble manners, high breeding, making the larger largest."

He was modern in his attitude toward education of women. The only education open to southern young women of that day was provided by private academies open only to the few and was largely for ornamental purposes: languages, dancing, embroidery, painting and music. The academies for young men gave only classical training. Woodrow Wilson's grandfather, James Woodrow, was principal of the Presbyterian High School in Lafayette, Alabama, soon after Dr. Shepard moved away.[11] Alabama had just begun half-heartedly to build a system of free public schools, which were looked upon with contempt by many. Dr. Shepard wished to train young women in his normal college to be teachers in the public school system, in which he was a staunch believer. The most striking evidence of his advanced ideas on education for women was the training of his own daughter as a physician. Louisa Shepard graduated in medicine at Graefenberg after meeting the same rigid requirements her brothers had to meet. It seems that the Professor's requirements were much higher for his own children than for the other students; they were compelled to do many times the amount of work ordinarily required. A second daughter, Sarah, died at the age of fourteen as she was taking her pre-medical training. However, she, like the other children, had actually begun her medical training informally at a much earlier age than fourteen. Anything else would have been impossible in that family.

Dr. Shepard knew the value of advertising. The celebration of his forty-sixth birthday has the marks of having been engineered by himself; at least he made good use of it for advertising purposes. He paid for long advertisements in the state's leading newspaper. He saw to it that the diplomas of his school were on real sheepskin and that the engraving was of high quality. In an advertisement he stated: "Our diplomas are fine."[7] On the sheepskin honor certificate was his own portrait, a handsome and exceedingly earnest young man. In the birthday celebration booklet there was his portrait in Masonic apron. At that time almost everybody in that part of the world who was at all respectable was a Mason.

His interests were so numerous as to necessitate superficiality. He took a leading part in politics, spending, according to his statement, $1000 for Polk in dinners, flags and other items. Religion was a major interest. He even tried preaching in 1845, when he was physically and financially in a low state. He admits that his two sermons did not stir the congregations.

"Nothing but the smell of brimstone and the awful singeing fires of an endless hell could have started them, and hardly that." He was first a member of the Methodist church but withdrew due to trouble about politics, and many years later joined the Baptist church. The first announcement of the Medical School[12] stated that "Allopathy, Homeopathy and Hydropathy and Botany would be taught scientifically." From the dose of calomel he usually prescribed it is difficult to believe that he had any sympathy for the teaching of Hahnemann. There was a fine spring on the grounds of his school; it probably pained him to see so much fine water go to waste, especially when hydrotherapy was a popular fad. At the time he wrote this advertisement he seems to have been riding a wave of enthusiasm and optimism about what this spring would do for him and for the public. His promise to teach botany undoubtedly refers to the Thompsonian botanical system of medicine, another form of popular medical quackery and fad at the time, for in the same advertisement his mention of Thompsonian vapor exposes him to the charge of having been a "steamer." His undertaking to teach four rival or antagonistic systems of medicine is almost unique in the history of medicine if we can accept the advertisement at its face value. A number of interpretations may be placed on his advertised inclusion of these systems of quackery in his teaching. It seems to me that he was induced to make such written claims for two reasons: he was interested in all manner of ideas, particularly the new and strange, and he saw in these systems something he considered of value. Each of these irregular systems had at that time a large enthusiastic group of followers and their inclusion, he probably thought, would make his appeal to public interest much stronger. Probably by offering to teach them scientifically he meant that he would teach anything in them which was of value. He does not seem to have had the familiarity with the history of his profession which gave his contemporary, Bassett, such contempt for cults and for fads in medical practice.[14] It is well to make it clear that the school was recognized in spite of this advertisement as being quite regular. His board of trustees included the best members of the profession of that part of the state. Incidentally, one member, Dr. W. M. A. Mitchell, a highly respected physician, was the father of present-day public utilities magnates.

It is quite clear that Dr. Shepard was decidedly egocentric. The published autobiographical sketch[7] is full of self-praise and undoubtedly sounds worse to us today than it did to the public for whom it was written. It barely mentions his very fine capable wife. "He has often been heard to say, and believes, that he has nervous energy enough to break his muscles and bones if he dared to exercise to the full extent of his will." Only a person of superb self-confidence would have stuck to such a vigorous system of therapy as he used.

In his dealing with his children and students he was a stern and puritanical disciplinarian, though he held their respect and affection. His family-faculty maintained a fine *esprit de corps*. In his day, hard liquor was on sale at most groceries and drunkenness was common; even the medical profession of that day deplored the dreadful abuse of alcohol. He prohibited liquor on his property and enforced *his* law.

He was a lover of music and included in one of his faculties a capable instructor of music. Several of his children showed considerable talent for music, the development of which he encouraged. The family of his oldest son later acquired considerable local fame for its brass band.

Dr. Shepard was in many ways typical of his time. It was a time of tremendous material expansion in America; new lands were being opened, new communities being formed in which one's position depended upon his ability to get ahead in the world. It was a time when ambition could give free rein to the imagination. There were communities throughout the South where the commoner was likely to be crushed by ruthless aristocrats but this was not true of Dr. Shepard's community. He was a self-made American, generations before America began to be bored by the type.

The Graefenberg Medical Institute holds peculiar interest in medical history in that it represents the *reductio ad absurdum* of the principles and practices which dominated medical education in America during that period. The medical schools of that day were run primarily for the profit accruing to the faculty, in total disregard of principles of sound pedagogy or the welfare of the public and without any regulation worthy of mention by society. Dr. Shepard showed that the operation of a medical school instead of being a grave public responsibility might be merely opportunity for the individual *entrepreneur*. An individual without financial resources, living in a rural pioneer community almost devoid of clinical material, with governmental consent and with the encouragement of the spirit of the times, single-handedly built and operated an institution whose graduates after four months of instruction were guaranteed the right to practice medicine.

It is a pleasure to acknowledge my indebtedness for assistance in this study to Miss Mary E. Mullen, Librarian of the Alabama Department of Archives and History; to the *Montgomery* Advertiser; to Mrs. A. G. Turner, to Mr. William Fuller and to Mr. Clarence Abbott.

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[Michaelis Ettmulleri: Philos. et Medic. Doctoris.]

THE INTOLERANCE OF GREAT MEN

DAVID B. RADNER, B.S.

CHICAGO, ILL.

IN classifying a man as great we consider two things: (1) his contribution in bringing the forces of nature under the subserviency of man, (2) the extent to which he has advanced human culture. To limit his greatness to the field of medicine we must add a third qualification: (3) the extent to which his work advanced our knowledge of physiology and medicine.

Scientists have never been over ready to welcome new truths that contradicted the old ideas which they had accepted for a life time. Some of them, however, have been over-obstinate in their refusal to accept. Prejudice and unreasonable opposition have often been manifested. When Galileo invented the telescope, the foremost teacher at the University of Padua refused to look through it at the moon and stars. The new discoveries in anatomy by Vesalius were opposed by contemporary physicians and surgeons.

When Auenbrugger introduced percussion he said, "I foresee that I shall encounter no little opposition to my views; envy and blame, even hatred and calumny have never failed to come to men who have illuminated art and science by their discoveries."[1] So also Laènnec, when he presented the use of the stethoscope, wrote, "For our generation is not inquisitive as to what is being accomplished by its sons. Claims of new discoveries made by contemporaries are likely to be met by smiles and mocking remarks."

Harvey's discovery of the circulation of the blood was opposed from the beginning; his patients considered him "crackbrained."[2] The medical profession was largely against him. In France, his work met with bitter and protracted hostility from the University of Paris which did not accept it until forty-five years after its announcement.

Jenner, Holmes and Semmelweiss were virtually crucified for their views, which the common herd accept today with as much enthusiasm as their forefathers showed in their venomous condemnation.

Even today one often hears research ridiculed by recalcitrants. Most men who have presented anything new have experienced hostility and discouragement which is only an attenuated form of being burned at the stake. Let us make a closer study of these controversies to learn more of the responsible individuals.

For reasons beyond the scope of this paper, the average student has a tendency to idolize and revere the old investigators. It is not for us to attempt to break down the predisposition to hero-worship built up by previous schooling. Our purpose is to attempt only the portrayal of these masters in the light of humans and as such subject to the misapprehension of all humans. In most instances we were and still are taught to receive the words of our professors as gospel truth. Consequently, is it any wonder that when we see names such as Claude Bernard, Sir James Y. Simpson, Rudolf Virchow, Justus von Liebig, Ignaz Semmelweiss and Edward Jenner, we assume everything following to be incontrovertible? As a matter of fact we see the names of these men used today only in connection with investigations with which we entirely agree. Thus it is quite natural that we often lose sight of another important fact: that such men have each done a vast amount of work, only a fraction of which comes to our notice. It is quite revealing therefore to learn, while looking through the less known works of our more illustrious predecessors, how bigoted some of them could be occasionally and in some things persistently so.

As an example let us look back at the days of William Hunter, the discoverer of separate maternal and fetal circulation, the first to describe venous aneurysm, retroversion of the uterus and other important conditions.[5] It was he who stated that "two morbid actions do not go on in the same constitution at the same time; that the brain is the fountain from whence flows health, disease and recovery."[9] It was left to Edward Jenner, the man who opened our eyes to the prevention of smallpox, to dispute Hunter's conception. Nevertheless it was Jenner's conception that the cow-pox originated from the heels of a horse.[9]

If we should now pass to the nineteenth century we would learn that Semmelweiss, the pioneer of antisepsis in obstetrics, the first to recognize puerperal fever as blood poisoning, was vigorously opposed by most of his contemporaries. Hecker, the famous epidemiologist of his day, had this to say of the investigations of Semmelweiss: "The doctrine of Semmelweiss is one-sided, narrow and erroneous; puerperal fever is caused by injurious effluvia like hospital gangrene."[3] Like Breisky, the eminent gynecologist, Virchow, the founder of cellular pathology, also fought Semmelweiss.[1] In discussing the plague of the obstetrical ward Virchow opposed the contagion theory and said that puerperal fever was due to a predisposition of the individual.[3] We shall leave Virchow here but return to him later.

This country also played a part in the life work of Semmelweiss for it was at about that time that Dr. Meigs, the obstetrical leader in the United States, defended his colleagues with the statement, "How can the obstetrician carry the fever on his hands. A Gentleman's hands are clean."[3]

Similarly, we see mentioned often the names of Simpson and Lister. It is to Sir James Simpson that we owe the introduction of chloroform as an anesthetic. It was said that he had "a decoy of Satan apparently offering itself to bless women; but in the end it will harden and rob God of the deep earnest cries that should rise to him in time of trouble for help."[7] On the other hand it was Simpson that was the strong opponent of Lister. The attempt to prevent sepsis in hospitals suggested by Lister was inadequate; Simpson advocated pulling down all infected hospitals and reconstructing them on the pavilion system.[4]

Let us now turn to Liebig, the eminent chemist responsible for the discovery of hippuric acid, chloral, chloroform and tyrosin, among a host of other organic compounds.[5] It was Liebig, also, who opposed Schwann, the author of the cell theory, in a controversy over fermenting bodies. Schwann claimed that he found in juices undergoing alcoholic fermentation many very minute globular bodies having the power of reproduction, which bodies he concluded were the exciting cause of fermentation.[6] Liebig believed fermentation and putrefaction were only physical disturbances of equilibrium which could be communicated by contact with other bodies. He affected only contempt or disbelief in regard to such vital agencies as bacteria or living ferments.[5] Though men such as Pasteur attempted to controvert his views, he refused to believe yeast was alive and with stiff-necked obstinacy declined to look through a microscope. Along with Claude Bernard and Pfluger, Liebig proposed the idea that all foodstuffs had to be changed into physiological albumin before they could be utilized by the body.[5]

Perhaps the turmoil of the nineteenth century was due in part to the vast amount of scientific investigation that was done. Apparently knowledge was being developed too rapidly for the slow digestive and assimilative powers of the human mind. Whatever the underlying cause may have been, the facts are that many of the scientists were propounding new theories and overthrowing others. It was at this time that Pfluger, the cantankerous physiologist after whom the law governing make and break stimulation of nerves with galvanic current was named, not only opposed Voit and Pettenkofer's views on metabolism but spent years trying to prove that glycogen does not originate from protein.[5] It was he also who attacked the neuron theory which today is the foundation of neurophysiology and psychology.

Even Claude Bernard, whom most of us consider as a demigod in the field of physiology, was not free from intolerance. It was not until other investigators had conclusively disproved his contention, that the free acid in gastric juice was lactic acid, that he changed his views.[5] It was Claude Bernard, also, who took part in a controversy with Pasteur over the origin of ferments. Let us remember that all of Bernard's physiological explanations were not true. He adhered to his argument that pancreatic proteolysis could not take place without the previous action of bile. The fact that his colleagues had disproved his ideas had little effect on him.[5]

Working along with Bernard in 1853 was Frederick William Pavy, who later was to become famous for his studies on cyclic albuminuria and arthritis. Pavy was so opposed to Claude Bernard's work that he devoted his whole life to disproving his master's thesis concerning the storage of available carbohydrates in the liver. Like Pfluger, he was forced to surrender his position towards the end of his life.[5]

One of Bernard's most interesting contemporaries is Max von Pettenkofer, whom we know for his work on bile, carbon dioxide and cholera. A more detailed look into his work reveals that he had strong views on the multiple causation of infectious disease in opposition to the theory of specificity of germs maintained by Cohn, Henle and Koch.[5] Probably the finest instance of shrewdness and prejudice is offered us in the life of Pettenkofer. In the study of cholera both Koch and Pettenkofer had enjoyed recognition for their respective work. But in 1883, when Robert Koch had first demonstrated his common bacillus,[10] Pettenkofer was forced to accept the work saying it was the germ "x" he had previously written about. But he said this did not solve the problem for, as he saw it, the vibrion alone did not produce the disease.[8] He further belittled Koch by adding that the conditions regarding the spread of the disease were known before Koch's discovery. From this arose a conflict between the two scientists which lasted as long as they lived and was continued long after by their pupils. Few scientists, however, had the fortitude to conduct experiments in the manner in which Pettenkofer did.

So embittered was he by Koch's work that on the morning of October 7, 1874, when he was seventy-four years of age, Pettenkofer, surrounded by all his laboratory assistants, swallowed 1 c.c. of fresh culture of a patient dying of cholera. He swallowed this on an empty stomach, previously neutralizing the acid with sodium bicarbonate.[11] As a reward for his daring nature he was spared. He suffered only a mild diarrhea. His influence led his assistants Metchnikoff and Emmerich to perform similar experiments. Though no one had considered the question of immunity at the time, Koch answered his opponent by saying he lacked the personal disposition.[8] Pettenkofer had many opponents but they appear to have lacked the impertinence to question the methods by which he arrived at some of his dogmatic conclusions. In one of his arguments over the transmission of cholera by ships he cited a certain number of instances which seemed to prove his point, fitting his explanation to the cases he chose. In another instance, when the relation of the soil to cholera was in question, Pettenkofer set forth his ideas on the basis of two groups of cases which he had presented. In the first group he chose 6 cases of a series of 36, while in the second group he used 16 cases from a number not given.[8] On one occasion Robert Koch charged him with distortion of facts to prove his theories without an actual study of conditions. A still closer study of some of his writings shows that Pettenkofer was quite proficient in the art of selecting cases to prove any of his contentions. As a matter of fact he was so well satisfied with his own work that in his latter years he spent much of his time picking flaws in the arguments of others.[8]

As another example of the obstinacy and persistency of mere man, we have Virchow, of whom mention was made previously. Though he was undoubtedly the greatest pathologist of his day, he also led in attacking many of his contemporaries. For instance, he opposed the Darwinian theory; he fought with the anthropologists over the peculiarities of the Neanderthal skull, attributing the differences to the effects of disease. He believed that the nervous system is not the center of life and does not control the nutrition of the peripheral parts. He believed in the duality of tuberculosis and opposed the newer views of Koch and Behring about toxins and antitoxins.[5] It is rather difficult today to conceive that such were the beliefs of the man who had founded cellular pathology, who was the first to observe leucocytosis; who was the author of the "Doctrine of Embolism"; the man known for his work in pathology, parasitology, anthropology and epidemiology.

More thorough search would be rewarded with many additional instances in which the founders and pioneers of the profession displayed such positiveness. As a last statement I would like to repeat that I would not detract from the esteem of the older investigators; all that I hoped to do was to illustrate if possible that, no matter whether the man is a master or not, he is still a man.

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[Trattato di Christoforo Acosta Africano. Venetia, 1585.]

THE TWO HEBERDENS

WILLIAM HEBERDEN THE ELDER (1710–1801)

WILLIAM HEBERDEN THE YOUNGER (1767–1845)

By SIR HUMPHRY ROLLESTON, BART., G.C.V.O., K.C.B., M.D.

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(CONCLUSION)*

(14) "A letter to Dr. Heberden concerning the Angina Pectoris; and Dr. Heberden's Account of the Dissection of one who had been troubled with the disorder" (3: 1–11, 1785). Read at a meeting on November 17, 1772. The letter dated April 16, 1772, was signed by "Unknown" who, having seen in the *Critical Review* an abstract of Heberden's paper (read in 1768 and published in 1772), recognized his own symptoms and described them in a way which the late Sir William Osler regarded as one of the best on record. Realizing that he might die suddenly "the unknown" left directions that Heberden, who by this time had seen 50 cases, should then examine his body. Three weeks later this was done by John Hunter who found nothing more than small areas of calcification in the aorta; Edward Jenner, however, who was present, wrote to Caleb Hillier Parry, "I can almost positively say that the coronary arteries of the heart were not examined." It may be added that in the spring of the following year John Hunter had his first attack of angina pectoris, which was so graphically described by his nephew Sir Everard Home; in May, 1777 he had a second attack, and Jenner, who soon after saw him when convalescing at Bath, had in the meanwhile seen two post-mortems on patients with angina and coronary disease, one of them apparently of coronary thrombosis. In 1778 Jenner wrote a letter to Heberden giving his diagnosis of angina and, for the first time, stated that the underlying cause was coronary disease. For some reason or other this letter, reproduced in Baron's Life of Jenner, did not reach Heberden who certainly never referred to the subject. Jenner did not publish the coronary origin, out of consideration for Hunter who, however, was probably fully aware of the association of coronary disease and angina, and of the true nature of his own symptoms. For in 1776 Fothergill published a fatal case in which Hunter in 1775 had found that "the two coronary arteries from their origin to many of their ramifications in the heart were become one piece of bone." Jenner sent his friend Caleb Hillier Parry (1755–1822) a full written statement of his opinion that coronary disease was the cause of angina, pointing out that he did not wish to make it known because of his affection for John Hunter. In 1788 Parry read a paper embodying this view to a small medical club, consisting of Jenner, Hicks of Bristol, Paytheran, Ludlow and himself, which met three times a year, usually at the Fleece Inn, Rodborough, Gloucestershire, and is therefore sometimes spoken of as "The Fleece Medical Society." This paper was not published, but in 1799 Parry incorporated its contents, including Jenner's statement, in "An Inquiry into the Symptoms and Causes of Syncope Anginosa, commonly called Angina Pectoris; illustrated by Dissections." There are resemblances between Heberden and Parry; they were both constant and copious notetakers, and left behind them works which posthumously added to their already high reputations, the "Commentaries," from the senior and the "Collections from the Unpublished Writings of the late Caleb Hillier

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* Part 1 appeared in the September issue, n.s. 5: 409, 1933.

Parry" (3 vols., London, 1825), which contained his account of exophthalmic goiter.

(15) "The Method of preparing the Ginseng Root in China" (3: 34–36, 1785). Communicated by Heberden for John Burrow on November 11, 1773.

(16) "Of the Measles" (3: 389–406, 1785). Read on August 6, 1785. This was the last professional paper published by Heberden during his lifetime.

Of these sixteen papers the outstanding are those on chicken-pox and angina pectoris as they give the first complete descriptions of these diseases. In the first of these two he pointed out precisely the diagnostic points from smallpox.

In the classical description entitled "Some Account of a Disorder of the Breast" he wrote: "The seat of it, and sense of strangling and anxiety with which it is attended may make it not improperly called angina pectoris," and he spoke of it as "a distemper hitherto so unnoticed, that it has not, as far as I know, found a place or a name in the history of disease." Descriptions of isolated cases, such as those of Seneca, the Earl of Clarendon's father, and patients of Morgagni, F. Hoffmann (1734), and Rougnon (1768) of Besançon, have since been unearthed; Huchard urged the claims of Rougnon (which have been discounted as based on a case of cardiac dilatation in emphysema), and the eponym "Rougnon-Heberden Krankheit" has been employed. In his "Commentaries" Heberden described the disease under the heading of *Pectoris Dolor* and said that he had seen nearly a hundred cases, so that in the interval between the reading of the original paper in 1768, based on 20 cases, and 1782 when the "Commentaries" were finished he had seen some 80 additional cases. A parallel and closely related event is the frequency with which the clinical picture of coronary thrombosis has been recognized within the last ten years. The two descriptions in 1768 and 1782 do not differ in essentials, but there are a few differences in details. Heberden regarded angina as a spasmodic and not as an inflammatory affection, and in a footnote in the "Commentaries" seems to confuse with it the mountain sickness described by H. B. de Saussure in 1779. Careful estimates of Heberden's account of angina pectoris have been given by Gairdner and by Osler.

The last volume of *Medical Observations and Inquiries by a Society of Physicians in London* (6: 340–407, 1784) contained "A Sketch of the Epidemic Disease which appeared in London towards the End of the Year 1775" to which thirteen medical men, including Heberden, Sir John Pringle (1707–1782), H. R. Reynolds, and Sir George Baker contributed. In his paper dated December 16, 1775, Heberden said that the epidemic began about October 28. In this symposium there was also a letter addressed to John Fothergill (1712–1780) who stood in much the same parental relation to these *Medical Observations and Inquiries* as Heberden did to the *Medical Transactions* of the Royal College of Physicians. Both these publications ceased after their sixth volume, and it would seem probable that the number of years which were allowed to intervene between the reading and the printing of the papers must have led to their extinction.

The great contest between the fellows and the licentiates, who were agitating for admission to the examination for the fellowship, of the Royal

College of Physicians of London, definitely began about 1752, "although the first mutterings of the storm were heard as far back as 1746" (Chaplin), and continued with occasional exacerbations until the beginning of Queen Victoria's reign. The licentiates were vigorous, not to say rough, in their methods; on September 24, 1766, they forced their way into a Comitia when Sir William Browne (1692–1774) was president, and on September 30 of the following year they were prevented from doing so only by the locked iron gates, to force which they in vain offered a smith 10 guineas and an indemnity of £300. After a number of actions at law and much pamphlet warfare the licentiates were in the nineteenth century admitted to the examination for the fellowship without being doctors of medicine of the Universities of Oxford or Cambridge, a requirement dating from about 1575. The anonymous author of the "Picture of the present State of the Royal College of Physicians of London" (1817) advised the licentiates to concentrate and elect their own president. Times have greatly changed since the eighteenth century, in the last year of which there were only 45 fellows of the College, for in 1876 the largest number of fellows hailed from Edinburgh closely followed by the University of London, and then came Cambridge, Oxford, and St. Andrews. In 1926 there were 376 fellows, of whom the University of London claimed 149, Cambridge 97, Oxford 51, and Edinburgh 36. In 1769 John Fothergill, the Quaker physician, and others brought an action against the College. A little later Heberden, with a broad and perhaps prophetic view of the dispute was, with Sir William Browne and Sir John Pringle, in favor of admitting John Fothergill, arch-rebel though he was, as a fellow; the proposal was lost by 13 votes to 9. Another licentiate who vigorously and ably advocated the reform of making the licentiates eligible for the fellowship was W. C. Wells (1757–1817), author of the famous "Essay on Dew" (1814). He supported Dr. Christopher Stanger in his action at the Court of King's Bench in 1796 by a long and spirited letter of 186 printed pages, but not published, dated July 1, 1799, to the Right Hon. Lloyd, Lord Kenyon (1732–1802), Lord Chief Justice: "Relative to some Conduct of the College of Physicians of London posterior to the Decree of the Court of King's Bench in the case of Dr. Stanger." In it he paid a high tribute to Heberden:

> Many of our physicians have no doubt received little injury from the causes of the corruption of character to which they were exposed; and some few have escaped their influence altogether. One of these few, Dr. William Heberden, I must conclude to have been known to your Lordship, from the eulogy which you passed upon him during the trial of Dr. Stanger's cause. Dr. Heberden, my Lord, stands in a manner alone in his profession. No other person, I believe, either in this or any other country, has ever exercised the art of medicine with the same dignity or has contributed so much to raise it in the estimation of mankind. I should think it proper to say that I had never been acquainted with Dr. Heberden and consequently could neither be dazzled by the splendour of his virtues, from approaching them too nearly, nor influenced in my opinion concerning them by benefits he had already conferred upon me; and that standing as he does on the verge of this state of existence ready to wing his flight to another glory, his

ear must be closed to the voice of flattery, had he ever listened to that syren, or were I base enough to solicit his aid in the foolish expectation of receiving from him some future reward.

On April 29, 1776, the Société Royale de Médecine of Paris was instituted, and in August of the same year Heberden together with William Cullen, George Baker, John Pringle, James Lind, John Fothergill and others, was elected a foreign associate of the Society. He accordingly wrote a brief autobiographical sketch in Latin to be inserted after his death in the Society's *Histoire avec mémoires* which, however, ceased to appear after 1789. Heberden the younger enabled Pettigrew to reproduce this notice of his father in facsimile in his memoir.

Heberden's versatility was shown in various ways; he was a botanist of some standing, and his activities at the Royal Society were such that Sir Joseph Banks (1743–1820), who was President from 1778 to 1820, gave the name *Heberdenia* to a genus consisting of a number of species of *Myrsine*, and one species, a Madeira shrub now known as *Ardisia excelsa* Ait., was for a time called *Heberdenia excelsa*. He was a fellow of the Society of Antiquaries (elected December 6, 1770). Further, there were few public charities which he did not support, and in this connection reference may be made to the history of the Royal Humane Society of which he was elected a vice-president in 1789. William Hawes (1736–1808), who practised in the Strand, was much interested in the resuscitation of persons taken out of the Thames, paid out of his pocket a reward to those who brought these victims to him, and in 1783 was lecturing on "Animation" at his house in Great Eastcheap. Thomas Cogan (1736–1818) who took the doctorate at Leyden on February 20, 1767, practised for some years in a restless fashion at Amsterdam, Leyden, and Rotterdam, and thus became acquainted with the activities of "the Society instituted at Amsterdam in favour of Drowned Persons" which had been founded in 1767. He settled in London about 1772 and joined forces with Hawes in founding the Royal Humane Society by each bringing fifteen friends to a meeting at the Chapter Coffee House in St. Paul's Churchyard in the summer of 1774. Cogan prepared the first six annual reports of the Society; he then handed his successful obstetrical practice to John Sims (1749–1831), M.D., F.R.S., a botanist as well as physician to Princess Charlotte. John Sims must not be confused with James Sims (1741–1820) whose prolonged presidency of the Medical Society of London (from 1786 to 1809) led in 1805 to the formation of the Medical and Chirurgical Society which in 1834 became the Royal Medical and Chirurgical Society and in 1907 was transformed into the Royal Society of Medicine. In 1780 Cogan retired to Holland "to prosecute his studies in moral philosophy." One of the five gold medals minted for the Royal Humane Society bears an inscription to his memory. Hawes became the first registrar of the Society, and wrote an account of the fatal illness in March, 1774 of his patient Oliver Goldsmith who, like Heberden, was an enthusiastic supporter of the Society.

Heberden's name has been attached, not an uncommon fate of other distinguished Medical Fathers, to comparatively minor achievements. The first of these is "Heberden's nodes" described in Chapter 28 of his "Commentaries" as follows:

> Digitorum Nodi. What are these little hard knobs, about the size of a small pea, which are frequently seen upon the fingers, particularly a little below the top, near the joint? They have no connection with the gout, being found in persons who never had it; they continue for life; and being hardly ever attended by pain, or disposed to become sores, are rather unsightly, than inconvenient, though they must be of some little hindrance to the free use of the fingers.

This eponym must be distinguished from that of "Haygarth's nodes" derived from "nodosity of the joints," a name applied by John Haygarth (1740–1827) in 1805 to the swollen joints in the disease called rheumatoid arthritis by Sir A. B. Garrod in 1858. In Gould's Medical Dictionary, edited by Scott, 1931, the eponym Heberden-Rosenbach nodes is given, after Ottomar Rosenbach (1851–1907), a hardly necessary hyphenation.

The other eponym, "Heberden's ink," has been applied to *Mistura ferri aromatica* which was used by Heberden about 1760 and remained in the British Pharmacopoeia until 1890; it contained iron and vegetable drugs, cinchona, calumba, cloves, cardamoms, and orange peel.

His "Commentaries de Morborum Historîa et Curatione" (8vo, Lond., price 7/6), completed in August, 1782, were brought out by his son William in 1802 who, though he did not admit it, probably translated them from Latin into English. The original manuscript is in the library of the Royal College of Physicians of London.

It is a small 4to bound in vellum, 519 pages, "Collectanea Spectantia ad Historiam Morborum et Remediorum" (Commentarii). On the fly-leaf is written in pencil: "I desire this book may be given to Mrs. Heberden for the use of any of our sons who shall study physic. W. H." Underneath in the handwriting of William Heberden the younger: "This & the english (*sic*) copy wch. is in London have been collated, & they agree with one another & with the other Latin copy." A few verbal alterations and some rearrangement of the chapters were made by the son, but the text is substantially the same as that of the printed book.

The library of the Royal College of Physicians of London also contains manuscripts closely connected with the writing of the "Commentaries":

(1) "Index Historiae Morborum" (Adversaria). Small 4to bound in vellum, 564 pages. On the fly-leaf the author wrote in pencil "I desire that this book may be given to any one of my sons who applies to the study of physic. W. H." Underneath in the handwriting of W. Heberden the younger is the following in ink: "The whole is in the handwriting of Dr. Heberden—containing the notes from which his Commentaries were drawn up. It is particularly requested that this book may on no account be taken out of the College, to whom it is presented by his son, W. Heberden."

At the end of the manuscript "22 Maii 1784" is written in pencil.

(2) A manuscript volume, presented by LeRoy Crummer, contains many chapters with the same titles as those in the published commentaries, though the text is not in the final form in the "Commentaries." This volume therefore shows the process of development of the published work.

The "Commentaries" at once acquired a European reputation; S. T. von Soemmering (1755–1830) published in 1805 a Latin edition at Frankfurt with a preface in which he spoke of the author as "Medicus vere Hippocraticus"; J. F. Niemann brought out another edition at Leipzig in the following year; and in 1831 Professor L. H. Friedlaender of Halle included it as volume 10 of the "Scriptorum classicorum de Praxi medica nonnullorum Opera collecta," Lipsiae, with a short life in Latin. The fourth English edition appeared in 1816. American editions appeared in 1818 at Boston, and in Philadelphia in 1845.

The "Commentaries" were built up gradually from notes taken in Latin during his active professional life in the chambers of the sick, from themselves or from their attendants; these were read over every month and expanded or modified as subsequent events made necessary. "It appeared more advisable to give such facts only, as were justified by the original papers, however imperfect, than either to supply their defects from memory, except in a very few instances, or than to borrow anything from other writers." In his preface Heberden goes on:

> An useful addition might have been made to these papers by comparing them with the current doctrine of diseases and remedies, as also with what is laid down in practical writers, and with accounts of those who treat of the dissections of morbid bodies; but at my advanced age it would be to no purpose to think of such an undertaking.

While no doubt thinking of the voluminous "Sepulchretum, sive Anatomia practica ex Cadaveribus Morbo donatis" (1679) of Théophile Bonet and of G. B. Morgagni's "De Sedibus et Causis Morborum" (1761) he may also have been aware of Matthew Baillie's "Morbid Anatomy of some of the most important Parts of the human Body" which, though it did not appear until 1793, must have been in preparation for some years and contained an illustration showing the emphysematous lung of Samuel Johnson whose necropsy Heberden attended in 1784. The descriptions of disease are concise clinical pictures drawn from his long experience and may thus be compared to composite photographs. The number of single clinical cases recorded is not large, and when given they are not in detail. The word "History" in the title refers to the course of the disease and not to the chronological knowledge and recognition of the morbid state. The substance contrasts with that of his Cambridge lectures on materia medica and the Goulstonian lectures on poisons by the absence of references to, and quotations from, authorities, ancient and contemporary, and represents his own observations. In this connection it may be interesting to recall that John Ferriar (1761–1815) after remarking that he had avoided quotations as far as possible in his "Medical History and Reflections" (1792) appended the following rather ambiguous footnote: "It has smartly and justly been said, however, by Gabriel Naudé (1600–1653) (who seldom ventured to hold an opinion, for which he could not produce classical authority) that they only are adverse to quotations who never expect to be quoted themselves." Heberden's style is simple, clear, logical, and without any effort at the ornate, hypotheses being rigorously excluded. On account of the classical purity of his latinity he has been compared to Celsus, and called by Osler the English Celsus. When describing the aphorisms of Hippocrates as the reflections of an aged physician on the experience of his life, Singer says that "among modern medical writings its closest analogue is perhaps the 'Commentaries' of the great English physician, William Heberden, the elder."

The preface begins by quoting Plutarch's division of a vestal virgin's life into three portions, in the first of which she learned the duties of her profession, in the second practiced them, and in the third taught them to others. This he regarded as no bad model for the life of a physician, and as he had passed through the two first of these stages he proposed to employ the remainder of his days in teaching what he knew to any of his sons who might choose the profession of physic.

There are 102 articles; the first two, "Of Diet" and "Ratio Medendi" are of a general character, and the remainder are arranged in alphabetical order, a plan of obvious convenience which did not escape Pettigrew's criticism that it does not possess the value of a "philosophical classification"; this, however, cannot but be regarded as an ideal not yet attainable. Then the short "Conclusion," followed by the "Appendix" containing (1) A Sketch for a preface designed for the *Medical Transactions* 1767, (2) "Observations on the chronical Rheumatism," (3) "On the Pulse," and (4) "On Opening a Vein in Haemorrhage." Some of the 102 chapters are very concise, such as that on Hernia: "Ruptures require no other remedy than a proper bandage or truss," no mention being made of herniotomy which had been popularized by Ambroise Paré and others in the sixteenth century. A chapter of four and a half lines reads: "I have seen a considerable degree of the hydrophobia in one whose throat had been much inflamed, and was suppurated; but I never saw a case in which it was the consequence of the bite of a mad dog." This admission is at first sight rather remarkable as a number of cases were reported in the contemporary medical publications of the time, including the *Medical Transactions* of the College of Physicians; but this perhaps may be partly explained by the nature of Heberden's practice and by his not holding a hospital appointment. It has been said that he was much more interested in diagnosis than in treatment, and he certainly examined the effect of treatment with a critical eye; his *obiter dictum* to the effect that "new medicines, and new methods of cure, always work miracles for a while" would not now be thought an exaggeration, and it has since been reasonably explained on the supposition that at first all the patients specially subject to the effects of suggestion take the treatment with uniformly beneficial effect, and that when their number is more or less exhausted the proportion of successes falls rapidly. When convinced of the truth he expressed it quite definitely, for example in the short chapter "Of the Bristol Water" which "is celebrated for its purity and for its virtues in consumption and several weaknesses," he remarked: "It certainly has no claim to be thought a pure water; and as far as my experience goes, it has as little just pretence to any of the medicinal virtues which it has been thought to possess." The longest chapter is on that *Opprobrium Medicorum*, as he, like the Rev. Richard Jackson, the founder of the Cambridge Professorship of Natural Experimental Philosophy in 1783, called the gout, and contains some stern remarks on the absurd view popularly taken at that time of a disease, which was "wished for by those who have it not, and boasted over by those who fancy they have it." Englishmen are stated eagerly to "resort to Bath in order to get the gout," for the prevalent belief was that an attack of gout cleared the constitution from other ailments, and was "a critical discharge of peccant humours." There was more fear of being cured of the gout than of having it, and the world seemed to be content to submit to it lest a worse evil should take its place. The Portland powder, the rise, reign, and fall of which had all occurred under his eyes, had sunk into a state of discredit and neglect, as much below its real merit as its first praises were above it. It probably lost its reputation partly as a result of the excessive doses given and partly "by having all the natural ill effects of gout imputed to it, particularly palsies and apoplexies." According to Sir A. B. Garrod it consisted of equal parts of birthwort, gentian, germander, groundpine, and the tops and leaves of the lesser centaury. It was purchased by the second Duke of Portland (ob. 1762) who was so much benefited by it that he made its composition public.

In the chapter on bronchocele there is not any reference to exophthalmic goiter which was observed by Parry in 1786 but not published until 1825. In the short chapter on aneurysm, however, Heberden wrote "many tumours of the neck, apparently of this sort, from having a strong pulsation in them, have after several years spontaneously decreased, till at last they have almost disappeared."

The eighteenth century was probably the least satisfactory period of the Universities of Oxford and Cambridge; according to G. M. Trevelyan "the slumbers of the English Universities were more scandalous than the lighter and more broken slumbers of the church"; Peacock in 1841 vigorously stigmatized the corruption which in the previous century had disgraced the Government and filled the Cambridge colleges with fellows who were distinguished neither by learning nor high principles, and Winstanley gives striking examples of the way in which the professors and college tutors neglected their duties. This state of affairs did not pass unnoticed at the time, and among the now forgotten pamphlets was an anonymous one of 53 pages, "Strictures upon the Discipline of the University of Cambridge, Addressed to the Senate" (8vo, pp. 53, London, 1792), which is ascribed by Bowes and by Halkett and Laing to Heberden, and appears to be the last of his writings published during his lifetime. The Senate are approached as the "Chirons of our future heroes, statesmen and philosophers," and their attention directed to the shameful negligence of some rulers of the University, to the absence of college tutors and fellows from the chapels, to the slovenly character of divine service there, and to "the pernicious custom of card-playing." The author wrote: "Since the act of Parliament in 1781 which gave £500 annually to each of the Universities towards the promotion of learning, Oxford has produced but very few learned publications from its own body, and Cambridge, I believe, none." At the present time (1932) the Treasury grant to the University of Cambridge is £107,500 annually.

In 1794 Thomas Percival (1740–1804) printed for private circulation "Medical Ethics, or a Code of Institutes and Precepts adapted to the professional Conduct of Physicians and Surgeons," which was then added to, amended, and published in Manchester in February, 1803. It contained letters from Heberden referring to his retirement and from Sir George Baker, but these were omitted in the second edition (1827). The "Code of Ethics" of the American Medical Association, drawn up before 1849, was based on Percival's work, and many of the phrases in it were those used in the original edition of "Medical Ethics" (Brockbank).

Sir William Beechey (1753–1839) painted Heberden's portrait in 1796 and, according to tradition, on arriving at Windsor for this purpose found that he had forgotten to bring the necessary canvas; rising to the occasion he obtained a shirt on which he proceeded to paint the portrait. Peachey, however, quotes Ernest Beechey, great-grandson of the artist, to the effect that he has not any knowledge of the tale of the shirt. The whereabouts of the portrait, which was engraved by William Ward (1766–1826), A.R.A., is not absolutely certain; according to Munk's "Roll of the Royal College of Physicians of London" it is that presented to the College of Physicians by William Heberden the younger at the opening of the present building in Pall Mall East on June 25, 1825, and now in the Censors' room. On the other hand it has been thought to be one of the two portraits in the possession of the Heberden family. A portrait in the dining-room of the Master's Lodge of St. John's College, Cambridge, has painted on it the words: "Gul. Heberden, Soc. Coll. 1739. Sir. W. Beechey pinxit"; but there is not any record how it came to the College.

In 1796 when in his eighty-seventh year he fell in the Chapel Royal, St. James's, and fractured his thigh, being thereby disabled from taking the considerable amount of daily walking exercise to which he was accustomed. His philosophical and serene temperament came to the rescue and when nearly ninety years old he remarked that though his occupations and pleasures had changed he did not remember to have ever passed a more comfortable year than the last. In the Harveian Oration of 1800 Henry Vaughan (afterwards Halford) praised him in a manner otherwise reserved for fellows who have passed beyond these voices. As in the case of Conrad Gesner (1516–1565) and William Osler (1849–1919) he had, in addition to ability, learning and industry, those properties of heart that endear the possessor to his generation. He would seem to be well described as "that grave figure with the mind of a philosopher and the heart of a child" (Hingston Fox).

He died at his house, 79 Pall Mall, on May 17, 1801, being senior on the list of the fellows of the Royal College of Physicians and in full possession of his faculties; within forty-eight hours of his death he quoted from an ancient Latin author to the effect that "death is kinder to none than those to whom it comes uninvoked."* He was buried in the parish church at Windsor, and on the south side of the church there is a monument to his memory with the inscription:

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* T. R. Glover, Public Orator in the University of Cambridge, kindly informs me that the following line from Publilius Syrus most nearly corresponds to the quotation: "Mori est felicis antequam mortem invocet"; that

> Near this place are deposited the remains of
> William Heberden, M.D.,
> who died the 17th May, 1801,
> in the 91st year of his age.
> He practised physic,
> first at Cambridge, afterwards in London,
> with great and unsullied reputation above 50 years.
> His distinguished learning,
> his sweetness of manners, and active benevolence raised him to an uncommon height in public esteem:
> above all, his deep sense of religion,
> which he cultivated with unremitting attention,
> regulated his conduct through a long and busy life,
> and supported him to the last
> with unabated cheerfulness and resignation.
> His widow and three surviving children
> erected this tablet to his memory.

WILLIAM HEBERDEN (1767–1845) THE YOUNGER

Though an extremely distinguished classical scholar and physician the son has not attracted the same amount of historical interest as his father, who no doubt overshadowed him. Further, his career as a medical man was comparatively short; in 1812 when at the zenith of his professional life he was suddenly left a widower and at once gave everything up, except his attendance on the King at Windsor, in order to look after his nine young children, and then became more interested in religion than in medicine.

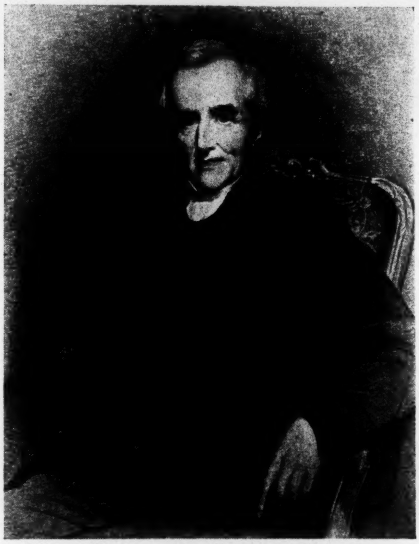

FIG. 4. WILLIAM HEBERDEN THE YOUNGER.

He was born on March 23, 1767, at Cecil Street, Strand, and was the second and longest surviving son of William Heberden the elder, then in his fifty-seventh year, and his second wife Mary Wollaston. After education at the Charterhouse, London, from the tender age of seven until he left as head boy of the school, he was admitted a pensioner at St. John's College, Cambridge, on March 30, 1784, thus following his father and his half-brother Thomas. He was admitted Ducket scholar on November 9, 1784, was first senior optime in the mathematical tripos of 1788, his uncle Francis John Hyde Wollaston (1762–1823) of Trinity Hall, senior wrangler in 1783, being one of the two moderators. In the same year he was awarded the second of the two gold (Chancellor's) medals open to "commencing bachelors of

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there is also the reputed dictum of Caesar that the best death is the unexpected: Suetonius, "Life of Julius Caesar," Chap. 87: in sermone nato super Unam . . . quisnam esset finis vitae commodissimus, repentinum inopinatumque praetulerat (the same in Plutarch's "Caesar," 63, 4, but that is in Greek); Pliny in his "Natural History," VII, 53, 180, says "Mors repentina est summa vitae felicitas." None of these he considers, exactly corresponds to Heberden's quotation.

Arts who having senior optimes shall make the best appearance in classical learning"; his brother Charles (1772–1796) was first Chancellor's medallist in 1793. William was admitted Platt fellow of St. John's College on March 11, 1788, and in 1790 gained the first Members' Prize, given by the Representatives in Parliament of the University for the best exercises in Latin prose. In the meanwhile he had entered the medical school of St. George's Hospital, where he signed the pupils' roll on December 23, 1788. It is perhaps curious that he did not proceed to a medical degree at Cambridge, but incorporated M.A. at Oxford from Christ Church on July 9, 1791, having proceeded M.A. at Cambridge in the same year, and took the degrees of B.M. on June 26, 1792, and D.M. on April 28, 1795, at Oxford. Possibly it may have been because Oxford is so much nearer than Cambridge to Datchet where his father was then living, but a more probable reason is that some colleges at Cambridge did not permit their fellows to be M.B.'s or M.D.'s, and Heberden was a fellow of St. John's.

On February 24, 1791, when only twenty-three years old, he was elected a fellow of the Royal Society, the year after Matthew Baillie (1761–1823) and the same year as George Pearson (1751–1828), his future colleagues as physicians to St. George's Hospital. In his first published paper "On the Influence of Cold upon the Health of the Inhabitants of London" (*Phil. Trans.*, 86: 279, 1796), he followed his father's and uncle's example, and handed on to other members of the family an active interest in meteorology which, as was shown by G. J. Symons, extended over the long period 1751 to 1897. Thirty years later he returned to the subject of temperature in "An Account of the Heat in July, 1825, together with some Remarks upon sensible Cold" (*Phil. Trans.*, 116: part 2, 69, 1826).

On November 15, 1793, less than five years from the date of entering as a student, he was elected physician, at the same time that Sir Everard Home (1756–1832), joint executor with Matthew Baillie to John Hunter's will, was elected surgeon, to St. George's Hospital. There were no assistant physicians to the hospital until 1834 when James Hope (1801–1841), the cardiologist, was appointed. Heberden's medical colleagues were John Robertson Barclay, F.R.S., appointed in 1799 Physician Extraordinary to the Princess of Wales, Matthew Baillie also a Balliol man, and George Pearson an early advocate of Jennerian vaccination. Heberden resigned this post in 1803, and was succeeded by Pelham Warren (1778–1835), F.R.S., an extremely successful physician, who took prodigious quantities of snuff, and when gazetted Physician Extra-ordinary to William IV on his accession declined the appointment because he had not been previously approached.

At the Royal College of Physicians of London Heberden was admitted a candidate on September 30, 1795, a fellow on September 30, 1796, was a censor in 1799 and 1808, and on November 1, 1823, an elect in the place of Matthew Baillie deceased. In his Harveian Oration of 1809, published in the following year, he gracefully eulogized his father. In the *Medical Transactions published by the College of Physicians in London*, to the first three volumes of which his father as the moving spirit had contributed sixteen articles, the son wrote articles in the fourth and fifth volumes, and indeed read two of them after he had retired from practice:

(1) "Of a peculiar Affection of the Eyes, with Observations" (4: 56–64, 1813). In this paper, read at the College on January 7, 1807, he recorded a case allied to nyctalopia and referred to the case reported in the third volume of the *Medical Transactions* by his father, but without bringing in the family name.

(2) "Some Observations on the Scurvy" (4: 65–84, 1813). Read on January 7, 1807. In it he mentioned that during the ten years (1793–1803) he was physician to St. George's Hospital he had seen only 3 cases of scurvy. It should be remembered that scurvy, a terrible scourge among sailors, practically disappeared from the Royal Navy after an Admiralty order enjoining the use of lemon juice was issued in November, 1795. This prophylactic treatment had been advocated since 1754 by James Lind (1716–1794), but was neglected until Sir Gilbert Blane (1749–1834) became one of the Commissioners of the Sick and Wounded Sailors in 1795.

(3) "The Mortality of London" (4: 103–118, 1813). Read on February 15, 1808. This article was on the same lines as a previous one published in 1801 (vide p. 578). He pointed out that during the first fifty years of the eighteenth century the burials exceeded the christenings in the proportion of 3 to 2, but that in the second half of the century this excess of burials diminished until in 1800 they were less than the christenings in the proportion of 12 to 13. This was in part at least due to greater care of infants and the fall in the death rate during the first two years of life.

(4) "Some Account of a Contrivance, which was found of singular Benefit in stopping the Excoriation and Ulceration consequent upon continued Pressure in Bed" (5: 39–44, 1815). Read at a meeting on March 31, 1813. It contains a drawing of a mattress with a hole in the middle.

(5) "A Case of Water in the Head unattended by its usual Symptoms, with Observations" (5: 173–187, 1815). Read on November 4, 1814. This described the necropsy of a deaf octogenarian, whose cerebral ventricles contained 8 ounces and the subarachnoid space 4 ounces of clear fluid. It would appear to have been an example of senile cerebral atrophy. The article began with the following dictum: "Though I have as little respect, as any man, for facts merely because they are extraordinary, yet when such facts can in any way contribute to perfect our knowledge or to correct our judgement, they acquire a degree of value in proportion as they perfect these ends."

The last volume of the *Medical Transactions* was published in 1820. After the opening of the present house of the College in Pall Mall East on June 25, 1825, evening meetings of a semi-popular character were instituted under the direction of Sir Henry Halford (1766–1844) who was president of the College for the unrivalled period of twenty-four years (1820–1844). The meetings were held monthly during the first half of the year, and lasted from 9 P.M. when tea and coffee were provided until 11 P.M. The papers were

> . . . on subjects peculiarly adapted to excite interest in a mixed audience of gentlemen and scholars, and capable of being illustrated by literature, the common bond of connection of all the liberal professions. The papers contributed by Sir Henry Halford, Dr. William Heberden (the younger), and some other fellows of the College were essentially of this character. (Munk.)

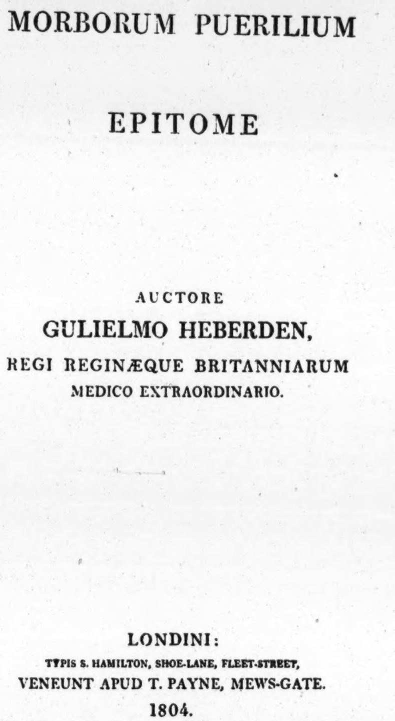
Formal discussion on the papers was not allowed at these meetings which were attended by distinguished persons, brought there by Halford's influence, such as the Duke of Wellington, the Primates of England and Ireland, and the Lord Chancellors Lyndhurst and Brougham.

In 1801 he published "Observations on the Increase and Decrease of different Diseases and particularly of the Plague," 4to, pp. 96, London. This was an elaborate discussion supported by many statistical tables of the Bills of Mortality during the whole of the eighteenth century, and the weekly returns for the period 1763–1799. His "advertisement," or what would now be called the preface, points out that:

> The following remarks were put together with the intention of subjoining them to a new edition of the Bills of Mortality. In submitting them separately to the Public, the Author is influenced by no vanity or self-conceit, no forwardness to broach new opinions, nor any wish to support a favourite system. . . . His object is to direct the attention of the medical world to a subject which has hitherto been very much neglected.

The appearance of this quarto pamphlet of 96 pages stimulated William Falconer (1744–1824) of Bath to bring out in the following year "An Examination of Dr. Heberden's Observations," in the 19 pages of which criticism was confined to the section on plague. Creighton in 1894 argued that Heberden's statement about the well-marked diminution of dysentery in London during the second half of the eighteenth century was vitiated by the inclusion of infantile diarrhea under this heading. In 1802 Heberden brought out his father's "Commentaries" (p. 570) both in the original Latin and the English translation which he almost certainly made; to both editions he supplied a brief biographical sketch of his father, to the Latin edition a dedication to George III, and to the English edition a Latin index at the beginning and an English one at the end. Two years later there appeared "Morborum Puerilium Epitome," 8vo, pp. 73, London, Auctore Gulielmo Heberden, which F. H. Garrison wrote "is of such superlative excellence and brevity that it might well be attributed to the father." It was translated into English by J. Smyth in 1805 with the expanded title "An Epitome of Infantile Diseases, with their Causes, Symptoms, and Method of Cure with additional Notes and Observations," pp. 79.

On account of his own abilities and his father's prestige he rapidly rose to a high position in the profession; in 1795 when only twenty-eight years of age he was appointed physician extra-ordinary to the Queen, in 1805 physician extra-ordinary to the King, in 1806 physician-in-ordinary to the Queen, and on the death of Sir George Baker in 1809 physician-in-ordinary to George III, by whom he was more than once offered a baronetcy with a pension, distinctions which his own feelings induced him to decline. In this respect he acted in the same manner as his senior colleague Matthew Baillie who declined a baronetcy. When Princess Amelia (1783–1810), the youngest and favorite child of George III, was dying of erysipelas, the King charged Sir Henry Halford to attend him in the event of his again becoming insane, in case of need to call in Heberden, and in case of further need Matthew Baillie. The shock of the Princess's illness brought about in October, 1810, the King's fourth and last attack of insanity; his medical attendants were Halford, Heberden, Baillie, H. R. Reynolds (1745–1811), and R. D. Willis (1760–1821), the son of Francis Willis (1718–1807) who with Reynolds had looked after the King in his attack of insanity in 1788 when the political atmosphere was much disturbed by party factions. As in 1788 so in 1810 the medical men were examined before the Privy Council and further before the Houses of Parliament. Chaplin has given a full account of the proceedings: "All the physicians were convinced that the King, although he had had three previous attacks and was in his seventy-second year, would recover and probably soon." In reply to the direct question as to their experience about the probability of recovery in the circumstances and age of a patient like the King, Baillie and Heberden did not pretend to any special knowledge, Reynolds and Halford justified their attendance on the ground of knowledge acquired in private practice. It is certainly strange that R. D. Willis was the only specialist called in. Reynolds, who had attended the King in all these attacks from 1788, was examined for two hours in the House of Lords, and in accordance with the etiquette was obliged to stand all the time; as a result he was so exhausted that his health broke down and death occurred on October 22, 1811. He was the grandfather of Sir John Russell Reynolds (1828–1896) who was president of the Royal College of Physicians of London from 1893 to 1896. At first there was some improvement in the King's condition, but after the middle of 1811 his mental condition deteriorated and in July, 1812 he had an acute setback; though a bulletin on August 1 reported improvement, Heberden in the same year stated that the King's bodily health was tolerably good but mental recovery was very improbable.



MORBORUM PUERILIUM

EPITOME

AUCTORE
GULIELMO HEBERDEN,
REGI REGINÆQUE BRITANNIARUM
MEDICO EXTRAORDINARIO.

LONDINI:
TYPIS S. HAMILTON, SHOE-LANE, FLEET-STREET,
VENEUNT APUD T. PAYNE, MEWS-GATE.
1804.

FIG. 5. TITLE-PAGE OF "MORBORUM PUERILIUM EPITOME" BY WILLIAM HEBERDEN THE YOUNGER.

This prognosis was fully confirmed by the outcome, for the King though lingering on till 1820 remained not only blind but in mental darkness. Of the following well known lines:

The King employs three Doctors daily—
Willis, Heberden and Baillie,
All extremely clever men
Baillie, Willis, Heberden,
But doubtful which most sure to kill is
Baillie, Heberden, or Willis.

there are several slightly different versions, such as the sixain beginning:

You should send if aught should ail ye
For Willis, Heberden, or Baillie.

The memoir of Heberden in the anonymous "Picture of the Present

State of the Royal College of Physicians of London," pp. 64–66, 1817, stated that the wording of the bulletins about the King's condition was always entrusted to him, "a task of some difficulty when curiosity was awakened on the one hand and prudence was necessary on the other." In reference to the distinction of the father and son Horace's words "Fortes creantur fortibus" were quoted as specially applicable, and his practice is described as "rather select than too extensive, the circles of rank being exclusively his patients."

On October 1, 1795, when living in Dover Street, he married Elizabeth Catherine (1775–1812), only daughter and heiress of Charles Miller of Shopwich, Oving, Sussex (second son of Sir John Miller, fourth baronet, of Chichester), and niece of Sir Thomas Miller, fifth baronet. They had nine children, four of whom, two sons and two daughters, survived him; four sons, William, Charles, George, and Henry were educated at St. John's College, Cambridge. He might therefore, like his father, be quoted in support of Hufeland's contention that "a certain abundance in the power of generation is favourable to longevity." His wife died after a few days' illness on May 21, 1812, in Pall Mall; this at once altered the whole course of his life, for in order to look after his young family he retired from London and, except for attendance on the King, from all practice. He settled down with his children and books at Datchet near Windsor. For his children he translated and had printed, but apparently did not publish, (i) Plutarch's "Brotherly Love," and published "On Education, A Dialogue after the Manner of Cicero's Philosophical Dissertations" (12mo, London, 1818 price 3/6, boards) and dedicated to his children, and (ii) a translation of "The Letters of M. T. Cicero to Titus Pomponius Atticus" with Notes (2 octavo vols., 1825, £1.6s., boards). The Rev. James Cowe, Vicar of Sunbury, which is within driving distance of Datchet, had married Heberden's cousin, Elizabeth Palmer, only daughter of the Rev. George Wollaston (1738–1826), D.D., F.R.S. Heberden was appointed Cowe's executor and in this capacity handed to the Rev. Leonard Jenyns the manuscript of the systematic records which were subsequently published as "Cowe's Meteorological Register, 1796–1839." He is said to have composed the inscription on the monument erected by public subscription nearly ninety years after Joseph Addison's (1672–1719) death and burial in Westminster Abbey.

In 1826 Heberden returned to London partly in order to afford his son Henry (1802–1828), M.B. of Downing 1826, who was a student at St. George's Hospital, "the information and encouragement which he had himself received with so much delight from a parent's lips." But evil days were ahead; the death of the medical son who cut his hand at a necropsy and died in a week from pyemia, of another son, George, in 1829, and the subsequent loss of his eldest daughter confirmed his inclination to devote the rest of his life to religious research and writing. According to the *Alumni Oxonienses* he was chaplain to the fellows of Exeter College from 1827 to 1829, and then vicar of Broadhembury, near Honiton, Devon. There does not appear to be any other evidence that he took Holy Orders, and this seems to be an example of two different persons with the same name being telescoped into one: it is almost certain that this incumbent was the Rev. William Heberden (1804–1890) who was the son of Thomas Heberden, the eldest son of W. Heberden the elder, and was a fellow of Exeter College, Oxford, 1828–30, held this cure of souls from 1829 to 1874, and from 1837 to 1874 kept a continuous record of the rainfall there. In 1830 William Heberden the younger published "Reflections upon the Gospel of St. John" (19 cm., pp. 302, Lond.), in 1836 he circulated a translation of "The Catholic Epistles" among his friends, and in 1839 at their request published a "Literal Translation of the Apostolical Epistles and Revelations with concurrent Commentaries" (8vo). In 1832 he presented his son William (1797–1879) to the vicarage of Great Bookham, Surrey.

His daughter Elizabeth Catherine married the Rev. Gerrard Thomas Andrewes, rector of St. James's, Piccadilly, and son of Gerrard Andrewes (1750–1825), dean of Canterbury, who when offered a bishopric by the Prime Minister replied in a loud voice, "nolo." Their daughter Elizabeth Catherine was the grandmother of H. W. Barber, physician-in-charge of the Skin Department of Guy's Hospital.

His portrait (Fig. 4) was painted in his later life by Richard Rothwell (1800–1868), Royal Hibernian Academician and Sir Thomas Lawrence's chief assistant; it was drawn on stone by J. S. Templeton and exhibited in the Royal Academy in 1843. The collections of the Royal College of Physicians of London, the Royal Society of Medicine, and the Wellcome Historical Medical Museum contain copies of this rather rare engraving.

He died on February 19, 1845, at his house in Cumberland Street, Marylebone, and was buried in the family vault in the parish church at Windsor where he is commemorated by the inscription:

> In memory of an excellent father,
> William Heberden, M.D.
> for many years physician to his late Majesty
> King George the Third.
> He was an elegant and an accomplished scholar
> graced by great suavity of manners,
> and influenced in all his intercourse with the world
> by practical and unaffected piety.
> To his children he was endeared by every claim
> that love or care of self-denial
> can make upon gratitude and affection.
> He was born 23 March, 1767, and died 19 February, 1845.
> In memory also of
> Elizabeth Catherine, his amiable and beloved wife,
> who died 21 May, 1812, in her 36th year,
> leaving 9 children.
> She was the only child of Charles, son of Sir John Miller, Bart., formerly of Lavant, Sussex.

His personal property was sworn under £9000. To his eldest son William he left the presentation of the benefice of Great Bookham, a moiety of the tithes, the adjacent vicarage, and his manuscripts on divinity. To his other surviving son Charles, a barrister, he left the tithes of Bevington and Blisbury.

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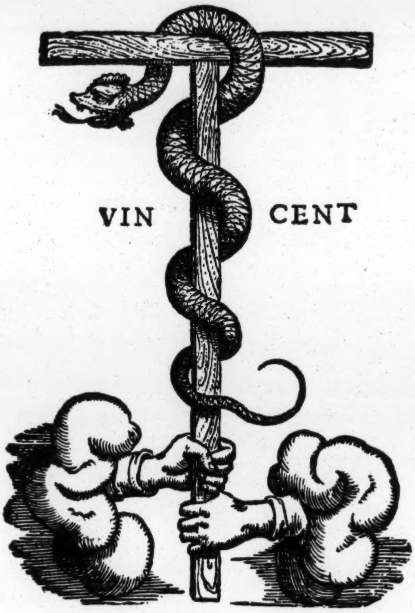

[Matthioli: Senensis Medici, 1570.]

AN INTRODUCTION TO THE HISTORY OF WOMEN IN MEDICINE

II. MEDICAL WOMEN OF THE MIDDLE AGES (*Conclusion*)*

By KATE CAMPBELL HURD-MEAD, M.D.

HADDAM, CONN.

EIGHTH CENTURY

As we turn from the seventh century to the eighth, we cross the Channel to Germany, Bohemia and Italy, where we find conditions of life not very different from those in England. The currents of Christianity and spiritual freedom, set in motion by Benedict and Scholastica, had penetrated all over Europe by this time, and along with the names of learned bishops there are records of as learned and pious women who devoted their time and money to the sick. Among them was an Abbess named Odilia, or Ottila of Hohenburg, in Germany, who in 720 built a monastery and a hospital which became famous for its cures of eye troubles. It was said that Ottila[1] was born blind, and according to the custom of the times she was cast out to die, utterly neglected by her parents. Some nuns found her by the roadside and took her to their church for baptism. No sooner did the holy water touch her eyes than their sight was miraculously restored. The child was educated at the monastery and became a specialist in the diseases of the eyes, like Saint Lucia of Italy.

Another "medical missionary" of this century was Walpurga (754–778)[2]. She was an English princess who studied medicine in order to practice among the poor. She founded a monastery at Heidenheim, between Munich and Nuremberg, and tended the patients in its hospital. In the stories of her life she is always described or pictured with a flask of urine in one hand, and bandages in the other. Her pupils became famous teachers in several institutions. After Walpurga's death, she, too, was sainted, and from her grave there gushed forth a healing spring of oil such as she had used during her life, and thousands of patients were healed by it, for faith cures were very common in those days.

Harless says (p. 143) that the daughters of Count Crocus of Bohemia were all skilled in medicine. This is affirmed by Pope Pius the Second, Aeneas Sylvius, who tells us that these women were named Brela or Kassa, and Tetka and Libussa. They were well trained and very religious as well as rich. Libussa "became a veritable Medea in her healing, whether by prayer, by medicine or by magic."

Turning to Italy we find that Nicaise is probably right in his statement that there were many laymen and women practicing medicine in Europe from the seventh to the ninth centuries, while priest doctors or nuns belonged especially to the sixth.[1]

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[1] Nutting and Dock, Vol. 1, p. 161. Jameson, p. 85.

[2] Alice Kemp Welch, *op. cit.*, Chap. 1.

[1] Nicaise, E. Les Écoles de Médecine et la Fondation des Universites au Moyen Age. 1891.

* Previous installments appeared in the ANNALS, n.s. 5: 1 (Jan.); 171 (March); 281 (May); 390 (July); 484 (Sept.), 1933.

Among the lay medical women, according to Neuburger,[1] there were several in Lombardy who had been taught by Paul the Deacon, the historian of Lombardy (720–800).[2] One of these students was Adelberger, or Bertha, the daughter of Desiderius the king, who ruled 756–774, the last ruler of the Lombards. There was a guild of lay physicians, says Paul, centering in northern Italy, in Lucca and Pistoia, and they established certain requirements for the practice of medicine. Paul the Deacon was almost the first medieval historian, a man of great erudition, and perhaps we may think of him as of Paul of Aegina, a forerunner of the teachers of the medical school of Salerno, or rather a link between the monks who were copying books and the women doctors who needed them. Paul the Deacon was a Benedictine monk of Como, much less medical than Paul of Aegina.

During the eighth century it is evident that manners and customs and languages were all changing because of the continually increasing volume of trade. French was becoming quite distinct from Latin, and Spanish and Italian were already somewhat differentiated from each other. The Arabs or Moors were swarming along the coasts and bringing into the ports many new and strange words, while Greeks from Constantinople, Jews from Palestine, and merchants from the far north all met at various centers and each had some influence on the language of the others, although Latin was still the language of the scholars and very advantageous for travelers as well. Even in far off Persia, however, in A.D. 712, the language of commerce and medicine was still Greek by order of the Caliph of Bagdad, for the Arabs were the rulers of that country.

This century saw not only the change in the calendar adopted by various nations, but great advances in geography. Bede died in 735 believing that the earth is flat, though circular and four cornered, with a layer of water above the sky, but even in his time there were some intelligent minds who dared to doubt these beliefs. Then, too, the handwriting was changing to a new style, beautiful to look at but hard to read, called the Beneventan script from the town in southern Italy where monks were busily copying manuscripts.

Not only were these significant changes taking place in chronology and geography and script, but as the countries were in the main at peace and visited by neither famine nor plague, their people became lazy and extravagant in their food and clothing. Men and women who could afford luxuries "decked themselves limb by limb" with robes of many colors. They wore vests of fine linen of violet color, scarlet tunics with hoods, sleeves with fur or silk trimmings, and they curled their hair with crisping irons. Women added a thin white veil to their head dresses with ribbons reaching to the ground, and they pared their fingernails to resemble the talons of a falcon. Even nuns dressed themselves in such style for their journeys to Rome on horseback. Abbesses took pilgrimages with a retinue of servants. They visited monasteries and abbeys en route to Rome, picked up the latest fashions in food and clothing, and heard the freshest gossip. As a rule they went as far south as Monte

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[1] Neuburger. *Op. cit.* Vol. II, p. 9.

[2] Encyc. Brit. 1929, Vol. XVII, Paulus Diaconus.

Cassino to buy books, but a visit to the Pope was the main object of the journey. One of these abbesses, at the end of this century, was Lisba, Abbess of Bischofsheim[1] on the Tauber, who was so learned that she was often consulted by Charlemagne and his Queen when they were at Aix. Another was Eadburg of Thanet, in Kent, England, who corresponded with Pope Boniface, telling him of her visions. Her letters are lost, but the Pope's replies show that she must have been a forerunner of Dante and of the other women like Hildegarde and Herrade of Landsburg who had vivid, poetic imaginations. Among the "seers" was the Abbess Hildelith of Barking in England who saw impersonations of sin and suffering, and souls like blackbirds, and fiery rivers, and a ferry of burning pitch over which souls passed to Paradise and the New Jerusalem. Some of the letters of these Abbesses were written with silver or gold ink on purple parchment like the famous Gothic Gospels, the Codex Argenteus of the sixth century. A certain nobleman named Ealdhelm[2] of the eighth century, who wrote a treatise in praise of virginity, praised ten women by name for such manuscripts. He says that they "were not only scholars and *gymnosophists* but as busy as bees collecting materials for study, biblical, medical, philosophical, and historical."

As for the more strictly medical or practical women of this century we know scarcely a name, but we find that all over Europe there were laws enacted for the medical profession which specifically mentioned women doctors, not midwives. The fee tables were much like those of former centuries, and the penalties for death or injury in surgical cases were as horrifying as in earlier times. If, for example, a patient died after an abortion the surgeon who caused it might forfeit her life, and her descendants to the seventh generation were obliged to pay an indemnity to the family of the deceased.

During this century the power of the Popes was steadily increasing. Pepin, the king of the western peoples in 754, made Pope Stephen II the "visible head of the church." Sarton says this act effectually divided the Italian peninsula into the kingdom of the Lombards, where Desiderius and his daughter, Adelberger, were happily ruling (756–774), and the papal kingdom at the south. In the time of Charlemagne, twenty years later, it was necessary for him to protect the papal territories from the Lombards, and at the same time to combine all the spare forces of the Eastern and Western kingdoms against the Arabs on every coast. In gratitude for this protection Pope Leo III placed the iron crown of Theodolinde on the head of Charlemagne, A.D. 800, and thus was born the Holy Roman Empire. Fortunately, Charlemagne was sufficiently powerful to bring peace to Europe for a time, and he speedily established schools throughout his great kingdom where boys and girls might study all the known arts and sciences. He built hospitals and libraries, endowed monasteries where manuscripts were copied, and encouraged the planting of herb-gardens. He had been a student at Monte Cassino and well knew the value of medical books and the necessity for medical plants, so that in 820, six years after his death, the herbs of the monastery of St. Gall, in Switzerland, were famous as drugs which were sold to "honest people" who were in reality itinerant vendors, and by them taken all over the world. Daremberg believes that many original medical books were produced at St. Gall which sometime may again see the light of day. Alcuin of York (736–804), a great friend and companion of Charlemagne, had been commissioned to institute medical teaching in every such monastery along with the ordinary subjects, and thus was founded the monastery of St. Albans in 794, not far from London, where its schools and its library of chained books drew students from all over Europe, especially during the ninth century when Alfred was king.

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[1] Tuker, M. A. R. and Malleson, Hope, Handbook to Christian and Ecclesiastical Rome. 1900, p. 80.

[2] Eckenstein. *Op. cit.*, 1896, p. 45, Chap. III.

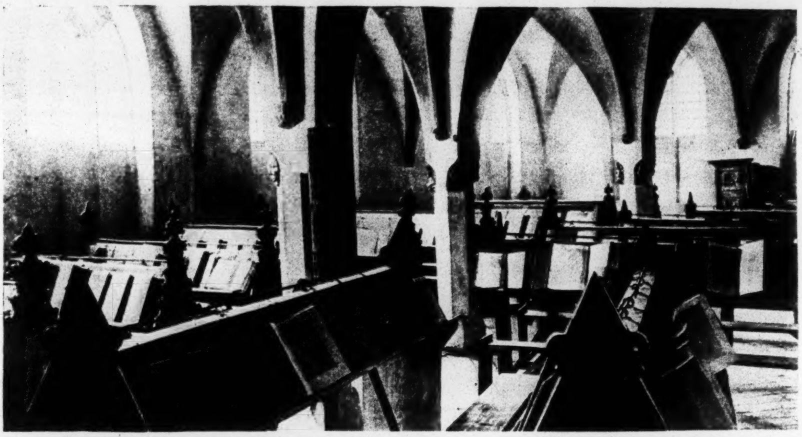

FIG. 36. A CHAINED LIBRARY IN HOLLAND, THIRTEENTH CENTURY, SAINT WALPURGA'S MONASTERY.

It is to be remembered that this was the century when the Arabs began to be famous as medical students and translators and writers of medical books. In 711 they conquered Spain, as they had already conquered Persia and northern Africa. Settling in Spain, however, was a longer and more difficult process than in the other countries, but the Arabs eventually made themselves at home and kept the peace for nearly five hundred years. Under the great Haroun al Raschid, of Bagdad (763–809), a remarkable civilization sprang up in all the Arab countries. Mosques were built in every large city and attached to these there was always a school and a hospital, generally built in beautiful style with the best of sanitation and the greatest comfort. In Bagdad the medical school had six thousand pupils, women as well as men, and the schools in Cairo, Kairouan, Cordova, and Toledo were almost as important. Women were given practical courses in midwifery and alchemy in order to care for the Mohammedan women, for midwives were naturally physicians and surgeons in the harems. At Bagdad however there was one especial man teacher of obstetrics, named Abul Faragh. He had been educated at the Nestorian school in Persia, and having been one of the physicians of Charlemagne's family he was summoned to be a teacher at the Mohammedan school in Mesopotamia because of his great ability. Hence, being strong and self-reliant as well as the teacher of obstetrics at this important school, he was the only man allowed to enter the lying-in rooms in case the midwives needed a stronger hand in difficult labor cases. He always praised them for their own skill and they were always grateful for his help.

The Arabs were famous translators and copyists from either Latin or Greek, and the Jews were as busy as the Arabs in literary work although their Latin was "barbarous."[1] In either case the libraries of the Arabs grew with leaps and bounds. That at Cordova, within a hundred years, was said to have two hundred and twenty-four thousand books. Many of our medical terms were coined at that time, such as alcohol, naphtha, camphor, etc.

Unfortunately, the Arabs and Jews disliked surgery and the study of anatomy. Dissections were hateful to them, but they did notice and record the fact that the human uterus is not seven-parted or like that of a pig. However, their statement made no difference in the usual teaching of anatomy, for Galen was not to be controverted, and after all, it was more interesting to them to translate books in a quiet corner of the library than to listen to the complaints of the sick.

A pertinent story from Haroun al Raschid's court (766–809) comes to us from several sources, quoted by George Saintsbury[2] and it tells of a slave girl at the court of the great Arab, who was so learned in medicine that none of the wise men could find anything in any medical author which she could not recite by heart. She passed an excellent examination in anatomy, the humors, astrology, materia medica, and she was an expert in testing urine by the newest methods. This may be just an old tale of the "Thousand and One Nights," but at least it tells us that there must have been slaves or free women who were as skilful as any man in the medical subjects usually studied, and what the subjects were.

In this and the following centuries there were several Arabians who wrote medical books for the general public. Such a writer was Mesue (777–837), son of a physician and a Christian. He was physician to one of the Caliphs of Bagdad. At his own house he opened an academy of medicine, and there he wrote the famous "Antidotarium" which at once became very popular because written in easy language on such common topics as fevers, bloodletting, astrology, baths, etc. This book became the basis of all the books on these subjects for many years. Mesue's theory as to the cause of disease was simple but somewhat original. He thought that disease was a sort of putrefaction which bred flies and that the flies caused the symptoms of the sickness. It is not known what Mesue's family name was, for this was evidently a pen-name, and in those days it was the fashion for authors to sign an assumed name or to be anonymous. The absence of signatures to paintings and manuscripts or other expert work in Byzantine times is as noticeable as in medicine; the work was the thing, not the worker, and each workman seemed to delight in his own creations because they were intrinsically beautiful or original. Evidently one of Mesue's hobbies was his anesthetic sponge. He called it his "consolation";

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[1] Neuburger. Vol. II, p. 47.

[2] Flourishing of Romance in the twelfth and thirteenth Centuries. 1897, pp. 2–37.

it contained poppy juice, mandrake, and vinegar soaked up by a sponge, heated and inhaled. He said it would cure the blues, drive away all pain, strengthen the patient's optimism, and help a woman in labor. This became a favorite two hundred years or more later among the teachers at Salerno.

NINTH CENTURY

Then comes another Christian Arab, Johannitius (809–873), who also wrote a popular medical book called the "Articella." This book, like that of Mesue, was mostly taken from Galen but written in an easy style and was also a favorite for centuries among Arabs, Jews, and Christians. We may ask ourselves if these entertaining books, written for the bedside practice of men and women may not have been written by women. Possibly women may have thought that their books would sell better if signed with a man's name.[1]

The most famous writer of the ninth century was an Arab named Rhazes (860–932). He is classified by Garrison with Hippocrates, Aretaeus, and Sydenham, as "a clinician of ability who described diseases with understanding." He had been a student at Bagdad, and he became the director of its largest hospital and also court physician. He is said to have written more than two hundred articles on medicine, astronomy, philosophy and physiochemistry. The majority of these are lost, but from those that remain we find that he knew the Greek, Arabic, Persian, and Indian languages. He had travelled in many countries, had collected books, and had written an encyclopedia of all knowledge.

Sudhoff says that Rhazes was the first to give us a book on pediatrics, the first to describe measles and smallpox, and the first to distinguish other exanthematous diseases. He believed in the curative effect of sunlight and fresh air, and in every way was as progressive as was possible in that century. There were sixty hospitals in Damascus when he lived there, all under his jurisdiction. It is therefore small wonder that he was able to diagnose certain diseases better than his predecessors who could not have had his wide experience.

It is amusing to find Rhazes with all his wisdom and honors not a little jealous of the women doctors by whom he was surrounded. One of his books[1] has on its title page a sort of apology or explanation as to the reason "why ignorant practitioners and common women may be more successful in curing certain complaints than better informed physicians." It is evident that sores were rankling in his breast because of the beneficial treatment of diseases of women and children by women doctors. He says, "If a doctor does not cure a patient quickly, a woman doctor is then called in and she gets the credit of the cure." He politely acknowledges, however, that he had often learned new remedies from women and herbalists . . . who had little knowledge of medicine but great insight into the human body, and from them too he had learned to try small doses of medicines rather than to use stronger remedies. He also says that women doctors often succeed by kindness and optimism without so great presumption as men are wont to display, and that women have greater humanity than men. Such fairness and frankness in Rhazes is certainly a delight, expecially when one considers how many great affairs he had on his mind. It was Rhazes who attended to providing good drinking water for the Muslim cities where hitherto dead animals were supposed not to harm any wells or streams, for anything wet was supposed to be harmless. It is sad to find that despite his generosity and learning Rhazes died blind and in poverty in 823. Sarton calls him the greatest clinician of Islam, and we may be sure that if he had desired to ignore women doctors he could have done as some other writers of the Middle Ages did, although, as we have seen, the greatest among them in every century either wrote books for women or at least mentioned their work and remedies as of value.

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[1] Neuburger, Vol. II, p. 47, says that the Arabians copied and translated into barbarous Latin whatever they found. They cared nothing for the rules of grammar, mutilated names, corrupted technical terms, made almost unintelligible transpositions in the text, and often confused the meaning so that it is a wonder that historians have been able to make any sense out of the manuscripts except by comparing many different copies of the same work. It is sometimes impossible to understand what the original writer intended to say. One historian tells us that in the ninth century there were one hundred Christian medical writers, three pagans who worshipped the stars, three Jews and five Mussulmans. Two hundred years later the tables had turned and there were only four Christian writers, seven Jews and the rest Mussulmans. See Withington, E. T., Medical History from the Earliest Times, 1894.

[1] Neuburger. Vol. I, pp. 360–363.

Unfortunately there is a dark side to the picture of Arabic greatness. In A.D. 831 the Emir of Kairouan sacked the libraries and monasteries of Sicily, and in 846 he destroyed the library and part of the monastery at Monte Cassino, near Naples. We remember that when Boccaccio visited this workshop of the monks he could not find even a small remnant of a manuscript. The monks and copyists had been driven away before the army of "infidels" who had disposed of everything left behind. A few scientific books were taken away by the robbers themselves, and thus saved, and it is possible that some others may have been smuggled into Salerno in that wild dash from the hill-top to the sea. It has also been thought that Salerno's famous school was a direct result of this raid on Monte Cassino, but as we shall see later, the school at Salerno was distinctly a lay school, whereas the older school on the hill was monastic. Probably women had been allowed to study at the monastery, especially when such liberal men were there as the famous Bishops, Desiderius and Alfano.[1]

However peaceful the large cities of the Arabs themselves may have been in the ninth and tenth centuries, there was little peace in the rest of Europe after the days of Charlemagne. As the Saracens or Mohammedans poured up from the south, so also the Norsemen poured down from the north, both advancing over Europe like huge stone rollers. And still further to disrupt peace came a decided opposition to the rule of the popes in southern Italy. In 928, Theodora, a concubine of one of the Roman senators as well as of the reigning Pope, John x, with the help of her children and others, attacked the papal palace, dragged the Pope out and imprisoned him in Castle St. Angelo where he soon died. Then Theodora's son was made Pope under the name of John xi. This act shows the temper of the women of Italy at that time. And not only were women obstreperous in Italy but also in England. When John Scot Erigena, or the Irishman, was teaching at the court of Alfred (849–901), his students, women as well as men, stabbed him to death because they objected to his theology. His worst fault seems to have been that he believed that creation was a process instead of one solitary act.[1]

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[1] De Renzi, Salvatore. Collectio Salernitana. 1852–59, Vol. i.

TENTH CENTURY

As this century was merging into the tenth we find a few interesting "straws" to show where the wind was blowing in Ireland. Alfred Percival Graves tells[2] us that there was peace in that country during most of the ninth century. The people were superstitious, poetic, imaginative, and they were preparing for the Millennium to the best of their ability. The practical teachings of Patrick and Bridget had been submerged in a sea of tradition. The test of any diagnosis was then to heal the disease quickly by any method, and therefore the criterion of a good physician was "to cure the malady with expedition, to let no after-consequence remain, and to name a diagnosis without pain." Whether this diagnosis was correct or not made very little difference to the patient, for the treatment was the same in any case. Graves (p. 138) tells us a story of a "leech" of this period to illustrate how the doctors and nurses did their work:

> It happened that one of the opponents of Cuchulinn received such injuries that every bone in his body was broken. He was taken to a bone-setter of Ulster to be healed. The leech's house had four wide-open doors to let the winds pass through freely. A stream of pure water also flowed through the hall. The leech and his assistants, many of them maidens, set all the bones and made the patient comfortable on a bed of healing, and then *they* (?) gave an eloquent and agreeable discourse to the audience which had gathered to watch the proceedings.[1]

In the meantime, while the Arabian writers were copying texts, the Jewish physicians, although "contraband luxuries" according to Billings, were the chief doctors of the royal families of Europe.[2] They were also eagerly sought and handsomely paid by princes and merchants in every country. Naturally, by their methods, they gained the hatred of the Christian and Arab doctors whose patients they treated. This led to the persecution of the Jews by those of other sects, and moreover the patience and gentle spirit of the Jews told against them at a time when war heroes were the ideals of all men and women. However, the large fees may have been a temptation to the physicians whether they were men or women, Jews, or Arabs, or Christians. We are told that one of the Arab doctors received the equivalent of $750 for bleeding and purging the Commander of the Faithful twice a year, and even less popular doctors were given handsome presents by grateful patients.

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[1] This theory was too revolutionary for the people of the Middle Ages. At this time the Abbey of St. Albans, where King Alfred established a medical school not far from London, was England's teaching center. Alfred's mother was his tutor.

[2] Alfred Percival Graves, Irish Translations of the Ninth Century. 1927.

[1] It is said that the Celtic Esculapius was named Diancecht, who lived A.D. 831–903. He had a son and daughter who excelled him in healing. Vida Latham (*Med. Woman's J.*, 1917) says that their house was on the bank of a stream, open to wind and sun, and furnished with heat, baths, etc.

[2] Withington, E. T. Medical History from the Earliest Times. 1894, p. 171.

Although in the tenth century medical treatment was unscientific if judged by the standards of the twentieth century, it seems to be probable that, since we know of only one, few women doctors had heretofore employed magic and astrology to any extent. We recall that either in the time of Celsus or during the third or fourth century A.D., there had been a magician named Cleopatra[1] who was also an alchemist, but she evidently had few women successors. Something tangible has always appealed to women doctors and their patients, and as there was generally some new remedy in the market or a reversion to an old one, there was no lack of practical methods to employ. Just at this time, however, there was a new theory of dosage on the *similia similibus curantur* plan, to be used with certain prayers so that it was only necessary to know where there was a pain and then to find its counterpart. For instance, the lungs of a fox were given for a cough, its brains for epilepsy, its fresh muscles for anemia, and plants of the approximate shape of a special anatomical organ to cure that organ.

When one begins to study the history of materia medica it seems amazing that people had sufficient faith to adhere to the most ancient medical notions promulgated as late as the tenth century; but even in Morocco today one finds these notions still in existence, and the Leech Book of Bald written about A.D. 900 is quite as good as anything now in use among the uneducated Arabs of Marrakech or Fez.

This Leech Book[1] of Bald is an Anglo-Saxon Materia Medica in three volumes, in fact an early encyclopedia. The first volume is an alphabetically arranged formulary of remedies, the second is on internal diseases, and the third is a concise account of herbs, charms, and prayers. Leech was the old name for doctor, and Bald may have been the name of the author.[2] The book was written in the common language for the common people of England. Women among the Teutonic and Celtic peoples had always been famous for their medical knowledge, and this new book arranged their material in an easy form. Whether at home or on the battle fields, they had their women surgeons and physicians to care for the sick or wounded men, women or children. The pagans of the Eddas, and the Celtic Christians, too, had traditions of a medical goddess Eir, and another named Eaba according to Vida Latham, who were quite the equals of any of the healing gods of Greece, Egypt and Rome, so that in all probability there had never been a time when the medical women of the west of Europe had been looked down upon by the men, but rather the contrary was the case.

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[1] Sarton has notes on this subject, vol. I, pp. 238, 339.

Costa ben Luca, of Baalbek, in the ninth century, prepared an epistle concerning incantations for the Caliph of Musta, in which he says that incantations and amulets help those who believe in them. He had a patient who was bewitched, and he cured her by showing her a passage from the book of Cleopatra, the magician, where it is written that such a patient must have her body rubbed with the gall of a crow mixed with sesame oil. The patient was cured at once by this means. See Thorndike, Lynn. Magic and Experimental Science. 1923, Vol. I, Chap. XXVIII.

[1] Payne, J. F. The Fitzpatrick Lectures. 1903. Neuburger. Vol. II, p. 18.

Cockayne, Rev. O. Leechdoms, Wortcunning and Starcraft. 1865, Vol. 2.

[2] Lynn Thorndike suggests that a Jew, named Jesu Haly, of Bagdad, may have been its author.

A few examples from the Leech Book will show us what sort of remedies these medical women used, and nevertheless how dependent they were upon magical phrases. For bleeding hemorrhoids:

> Delve round a plant of celandine root and take it with thy two hands turned upwards, and sing over it nine paternosters, and at the ninth, at Deliver us from evil, snap it up and take from that plant and others that may be there a little cupful of the juice and let him drink it. It will soon be well with him.

For the delirious:

> Gather bishop's root, lupin, boneset, polypodium-fern, corn-cockles and elecampane, sing the names of the saints and a pater-noster thrice about these herbs, then take them to church and sing again the names and twelve Masses in honor of the twelve apostles.

For a large boil:

> Dig up a dock, jerk it from the ground to the tune of a pater-noster, take five slices of it and seven pepper-corns, mix them thoroughly while singing twelve times the miserere and gloria and pater-noster, then pour it all over with wine, and at midnight drink the dose and wrap thyself up warm.

Some of their remedies were to be dug or cut at a certain time of the moon, others were to be stabbed with a knife, in silence, and left while the gatherer went to church to pray, and then returned to take it and mix it with moss from a crucifix. Holy water from a baptismal font, wax from an ear, pious formulae written on cloth and worn by the patient were all considered useful.

For pains of labor the names of the Virgin Mary or of Lazarus were to be written in wax and bound beneath the foot of the patient—the name of Lazarus being used because he came quickly out of the tomb when called. Sores and eczema were exorcised by calling upon Solomon, and Longinus was mentioned in connection with a stitch in the side. For fever several herbs were gathered, such as fever-few, fennel, and plantain, then boiled with holy water, and the names of the Apostles repeated along with a hodgepodge of Arabic words denoting ancient idols.

Could anything be more absurd than these remedies? It would hardly seem possible, although even after a thousand years there are still intelligent people who believe in such extraordinary nonsense as the possibility of preventing rheumatism by wearing a rabbit's foot or dried potato or a "cramp ring," or in curing a pain by having a nonsensical "oxygenator" tied to the patient's foot or hand.

As for the midwifery of this century there is little to say except that it had degenerated abominably from the time of Cleopatra the gynecologist, and Soranus. There was no longer any idea of turning the infant, either by podalic or cephalic version. Often the ignorant midwives waited until the infant and the mother were both dead before extracting the child with the fillet and hook. Gynecology consisted mainly in the use of poisonous remedies for sterility, and barbarous operations for procuring abortions, instead of the tampons and soothing remedies of the earlier times.

There are still, however, native doctors in Egypt and Morocco, descendants of the educated Arabs of the ninth century who depend upon the remedies of the early Middle Ages. Magical stones are used today which are said to have been "tested" before being used for certain complaints. Painful spots on the surface of the body are tatooed in peculiar designs while the so-called doctor mutters some jargon over the patient.[1] The midwives still believe in the expectant method of watchful waiting, or else, while the patient squats on the floor, the midwife scratches and pulls on the baby. The will of Allah determines life or death, and nothing can change the fate of the patient.

The old teachings of Hippocrates and Herophilus have thus been superseded among the Arabs of our time by native traditions that have nothing to do even with Trotula of Salerno of the eleventh or the great midwives of France of the sixteenth and seventeenth centuries. In the market place in Marrakech and Fez the traveler today may see Arab so-called doctors squatting on the ground while applying filthy remedies to sore eyes, giving goat's dung pills to sick patients, and adjusting very inadequate splints to a broken bone. Fortunately, the Doctoresse Légey and her assistants from France are displacing the natives and are carrying on maternity hospitals and clinics for these poor and benighted people whose ancestors were once the medical lights of Europe.

While we do not forget that it was to subdue these Arabians, the Saracenic followers of Mohammed, that the crusades were instituted, we must remember that in the tenth century these same "infidels" were the best medical writers of Europe, and in addition to those already mentioned, the Jew Donnolo (born A.D. 913) should have his name recorded, for though not an Arab born, he was kidnapped as a child by the Saracens and taken to Palermo to be educated. There he learned both Arabic and Latin, studied all the sciences, and finally escaped to Salerno, where the medical school was in its infancy. He was quite a prodigy and soon became a friend of the noted Christians who went to Salerno either for its healing springs or its medical school. Here Niketas was copying Soranus once more and illustrating his manuscript with nearly a hundred free hand drawings, and here Bishop Peter III, and Bishop Alfanus, "*prudentissimus et nobilissimus clericus*" were already teaching medicine. Donnolo, owing to his acquaintance with several languages, became also a teacher of materia medica, and his "Antidotarium" was popular for years because of its condensed list of drugs, only about one hundred in all, mostly of vegetable origin, as against nearly seven hundred which at the same time were being recorded by the Japanese. Sarton (p. 682) believes that to such men as Donnolo who wrote in Hebrew, and his contemporaries who wrote in Latin and Greek and Arabic, was due the founding of the great cosmopolitan school of Salerno, where, as we shall see later, women as well as men belonged to the staff of teachers.

There is one other Mohammedan writer, perhaps the most important of all, whose books were used by the medical profession for centuries, very nearly superseding Galen. This was Ibn Sina, better known as Avicenna. He was a great scholar, born near

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[1] See the writings of La Doctoresse Légey, published by the Institut des Hautes-Études Marocaines. Also her Contes et Légendes Populaire du Maroc, 1926.

Bokhara in A.D. 980. In his fifty-seven years of life he wrote one hundred and five books in Arabic and Persian, elaborated and reclassified the works of Galen and Aristotle, and although never much of a practitioner and hating the sight of blood, he was able to keep a score of copyists busy while he went about in very beautiful clothes, and led a licentious life. Such was the man whose works seemed so perfect and so final that they discouraged all original experimentations and investigations for hundreds of years.[1] To the women doctors of all those years his books were precious, for they were easy to understand, easy to memorize, and pleasing in style. Avicenna offered them a far wider range of medicines than Donnolo had done, and that was important in an age when there were no specific remedies, and when the more complex the nostrums the better they were liked by the patients.

While Salerno's medical school in the early part of the tenth century was in its infancy men and women of all nationalities met there to study and practice medicine in perfect equality and harmony, but the papal kingdom was having troublesome times. Thieves and assassins roamed the streets of Rome, and the court was growing more and more dissolute. The great Hildebrand conceived a brilliant idea of reforming the priesthood, emancipating church and state, and uniting the Greeks, Latins and Jews in a southern kingdom under the Normans led by Robert Guiscard, brother of William the Conqueror of England. We shall see in a future chapter why these schemes did not work, but for the time being, and under the Normans, Hildebrand's plans did give opportunity for the growth of the Salerno medical school as an international institution.

In the meantime at Braunschweig, in the northern part of Germany, there lived certain learned women, one of whom, Hrosvitha, is historically famous and as worthy to sit among the immortals as any of the Arabian writers. These women were as far removed from the wizardry and superstition of the Anglo-Saxon women, and from a reliance on the truth of the tales of Merlin and the troubadours of France, as they were from the alchemy of the Saracens and the distractions caused by the wars of the Holy Roman Empire. One of the most noted of these women was Hrosvitha, a Benedictine nun of Gandersheim, "*illustris et clarissima virgo et monacalis,*" (935–1000) who wrote religious dramas modelled on Terence, Vergil, Horace and Plautus. In the midst of her pedantry she gathered herbs for medicine and traveled about among the rich and poor, caring for the sick.[1]

Sarton[2] says that Hrosvitha "embodied the science, mathematics, literature and drama of her age." Her six religious comedies were anticipations of the later miracle plays, and her "Carmen de gestis Oddonis," (i.e. the history of Otto I, the Great, died May 7, 973) was comparable to the English Chronicle written for or by Alfred the Great who died in 901. She was the daughter of Heinrich, duke of Bavaria, and cousin of this Otto I. It is said that she read Greek and Latin and "wrote both by divine grace."[3]

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[1] Sarton, pp. 709–711.

[1] Crump and Jacobs. *Op. cit.*, p. 167.

[2] Sarton, G. *Op. cit.*, p. 658.

[3] Eckenstein, Lena. *Op. cit.*, p. 162. (Otto I, the Great, was crowned with the iron crown of Theodolinda in Rome, 926.)

It is a pleasure to visualize this nun Hrosvitha as she went about on her peaceful mission among the suffering mortals in the neighborhood of her monastery, returning to her cell after evensong to write her history and dramas. Although she never became an abbess, we are told that she taught medicine, prepared remedies, and treated patients like any other woman doctor, besides attending to literary work in her free hours. We may only regret that she never wrote anything that has as yet come to light on medical topics and much of her history is lost, but when the countries all about Braunschweig were in tumult the monastery at Gandersheim was an oasis of peaceful study. This monastery and others like it were the forerunners of our women's colleges, and were well endowed. Their standard of education was high, their teachers came from aristocratic families, and they had no lack of pupils, for no vows were obligatory for either students or teachers although they were Christians. Many of them, however, became abbesses in due time.

Such a woman was Mathilda, abbess of the monastery at Quedlinburg, who ruled the whole empire during the infancy of her nephew, Otto III, grandson of Otto I; she even raised an army and defeated the invading Wends in 983. She also supplied Hrosvitha with considerable material for her historical work. But even before Hrosvitha's birth, and a generation before Mathilda, we find that Maud, the empress of Germany, queen of Henry the Fowler, the first Saxon king (crowned 919), was spending all her money on the poor and sick "whom she tended with pious fervor." And Cunegunde, somewhat later the widow of Henry II, the emperor of Bavaria (crowned in 1002) retired to a monastery and gave her time and strength to the sick. She became a Benedictine nun in 1024, and at once founded the monastery of Bamberg. There is a story that when she was accused of having immoral relations with a man of the court she walked bare-footed over burning plowshares to prove her innocence. Whether or not her feet or her reputation were scorched the story shows us a vivid picture of the times. We also have a word picture of another nun who, while having an ecstatic vision, had self-control sufficient to keep the fish she was frying from burning. And so we find these women always very human, often very benevolent, and frequently generous to a fault, doing the humble duties of physician and nurse in the midst of this troublesome century, when, by command of Saint Vladimir the Terrible, the Russians were forced to adopt Christianity at the point of the sword, and Constantine VII was compelling the people of his vast kingdom not only to keep the peace but to study art and literature, and to build great churches, while at the same time the Bulgarians were swarming into Greece, and the Danes into England, and France and Spain were undergoing continuous internal revolutions.

ELEVENTH CENTURY

As the tenth century merged into the eleventh we find the medical Arabs still copying Galen, disbelieving in the efficacy of holy relics as remedies for disease, trying experiments with new chemicals, and translating books unceasingly from one language into another, thus preserving the historic documents which became the first textbooks for the new medical school at Salerno, on the west coast of Italy. In China, moreover, a new medical treatment by acupuncture was developing, by means of which medicines were done away with entirely, and the body divided into more than three hundred parts from each of which a devil of disease might be exorcised. This theory, fortunately, did not affect the students of the West where the "Canon of Avicenna" was becoming the great textbook of medicine, as much prized as the "Almagest" of Ptolemy (second century A.D.) on mathematics, astronomy and geography, written eight hundred years earlier. When, therefore, a student of the early eleventh century wished to study medicine he or she studied with a small group under a famous master in his or her own country, or went in crowds to larger schools organized on the plan of Plato's academy, such as that at Salerno, which was a great and easily accessible port for merchants from all over the world. Thus this became in a modern sense of the word the first coeducational medical school in western Europe, as in fact it was the beginning of all scientific education in medicine.

At the end of the eleventh century, however, there was also a medical school in Constantinople where Anna Comnena (1083–1148), daughter of Alexis I, studied all that was then taught of medicine and the liberal arts. Like Hrosvitha she too wrote a great history, an elaborate work in fifteen volumes, of her own father's reign (1069–1118). She also practiced medicine in the hospitals and orphan asylums of Constantinople, and in her father's last illness she presided at the daily medical consultations of the doctors as to his condition and treatment. In her historical work she gives us many an interesting bit of information as to medical practice during her father's life, as well as sidelights about the dress and homes of the people. We find it pointed out, for instance, that Robert Guiscard was tall and handsome and, like women, he wore his long blonde hair in ringlets under his helmet. Women's caps were modeled on these helmets, and as women wore their cloaks in the same fashion as those of the men it was difficult at a distance to distinguish men from women. Jewelry and amulets, bright-colored undergarments, and sleeves patterned on those of soldiers were worn by men and women alike.

The houses of the people in Constantinople were more comfortable than those in the country, but even in the time of Anna Comnena they had no chimneys and no window glass; their beds were bunks along the walls, or they slept on straw mats on the floor of the hall. Smoke from the central fire found exit somehow from the roof, but at times the eyes of the family and their guests must have wept involuntarily from the smoke that lingered down below. We have already seen that the Empress Theodora, in the sixth century, had installed great cisterns of drinking water for the city, but as yet there were no sewers to carry off the waste into the sea.

Such, then, were the conditions of life in most of the civilized countries of Europe. They force us to realize that the Middle Ages were by no means an advance in comfort and civilization over the old Greek and Roman times, although women in certain respects were regarded more highly than in the time of the Roman

Empire. They were literary, and probably more interested in charitable work, and much more active in medical practice than before. It is seldom that they are referred to as midwives or nurses, but usually as physicians or surgeons and we may not doubt that their work was appreciated. There was a poet Saint Bernard[1] of Cluny, who in 1108 wrote:

> I am lyght as any roe
> To praise womene wher that I goo.

And again:

> A woman is a worthy thyng,
> They do the washe and do the wrynge,
> Lullay! Lullay! she do the synge,
> And yet she has but care and woo.

But further, as an indication of woman's universal desire for peace at that time, we find the following beautiful lines from his pen:

> Yes, peace! for war is needless,—
> Yes, calm, for storm is past,—
> And goal from finished labor,
> And anchorage at last.[2]

This great Bernard of Cluny built many hospitals wherever he went on his singing journeys, preaching reconciliation and happiness through Christian methods. Like him was the Italian Lanfranc (born in Pavia, 1005) who had studied medicine and built hospitals wherever he could. His hospital in Canterbury was the best in England, opened in 1084, the ruins of which are still visible.

It was about this time that the great nursing "orders" were established, as well as the order of the Knights of Saint John of Jerusalem organized for the purpose of caring for sick pilgrims on their way to the Holy City.[1] This latter "order" was founded by a certain Gerard (1040–1120), who became a guardian of the hospital at Jerusalem. The Order of the nursing sisters, called the Béguines, was founded in Flanders in the same century, and officially recognized by the Church under Pope Innocent III in 1216. This Order is still in existence, and its nursing sisters still visit patients in the hospitals and in their homes all over Belgium, conspicuous in their black gowns and white bonnets but quiet and serene in their little community houses.[2]

Finally, in the eleventh century we again find examples of queens and royal women to whom the study of medicine was a pleasure as well as to the common people. Such a queen was Gisela, wife of Conrad II, who was crowned head of the Holy Roman Empire in 1024. Gisela is said to have held clinics at her castle gate every day, and she attended patients in the hospitals as well. Another medical queen was Margaret of Scotland, niece of Edward the Confessor and wife of the great Malcolm. At the age of twenty-four she was the mother of eight children, but she found time to treat the sick in the hospitals or in their homes, washing their wounds, giving them their medicines, and superintending all the arrangements of the hospitals. Malcolm could neither read nor write, but he admired the jeweled bindings on his wife's books and presented her with many new ones. Margaret died in 1093, and after she was sainted her bones were taken to the Escorial in Spain, where they are said to have worked many miracles of healing. Her daughter, Maud or Matilda, wife of Henry I of England, was also one of the most learned women of the century, and she inherited her mother's love for the study of medicine and for the personal care of the sick. Whether or not these women ever officiated in midwifery cases is not known, but Rhodius tells us of certain women "quae difficilem partum expertae sunt." He also tells us of a Joanna Serrana who wrote as follows: "Jam vero nonnae et ipsae obstetrices remediis et carminibus possunt portas exsuscitare."

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[1] Bernard of Cluny wrote many hymns, such as "Jerusalem the Golden," etc.

[2] Translations by John Mason Neale from "Theodora Phranza, or the Fall of Constantinople," 1903, and from Neale's transation of Bernard's "De Contemptu Mundi."

[1] We recall that in the early centuries of Christianity, Fabiola and other Christian women built hospitals in the Holy Land. When Godfrey de Bouillon visited Palestine in 1099, soon to be its king, he found these hospitals in excellent condition and the patients well cared for, even though the Hospitallers themselves were hungry and ragged. There was a noble Roman woman named Agnes at the head of the hospital of Saint Mary Magdalene. She had a corps of well-trained women nurses under her. These were the Sisters of Saint John. They nursed Mohammedans as tenderly as Christians. Later they built a hospital at Valetta, Malta, which is still in existence, and there, during the great war of 1914–1918, scores of British medical women superintended the medical work, performed surgical operations on wounded soldiers, treated their diseases, and acted as pathologists, radiologists, etc.

[2] Les Béguines de Bruges, Abbé Hoornaert, 1924. Bede, p. 215, mentions their patron Begu as a nun in A.D. 680. She was also called Bega and Bees.

Thus we find from our study of the medical men and women and their surroundings during the Dark Ages that, like the little coral insects, they were unconsciously building up a great island upon which the superstructure of the medical school of Salerno, the Hippocratic city, could be founded as the basis of scientific medicine. We have also found that there were several women who did write medical books on gynecology which Soranus and Moschion and Aetius and others used freely in their own compilations. At the same time, from the fact that we know so few names of outstanding women doctors we may infer that because they did not keep their names before the public it was because they were too busy with a medical practice, such an ordinary vocation as not to be worth mentioning any more than it would have been necessary to call attention to the work of an ordinary mother. It was for such quiet women, therefore, that many books on gynecology were written, just as at a later age many other books such as that of Rösslin on obstetrics were compiled for the midwives. The study of the trivium and quadrivium, music, arithmetic, grammar, logic, etc. were the foundations for all vocations, but even if studied freely by women they alone of course could not have made so good a doctor as the practical study of

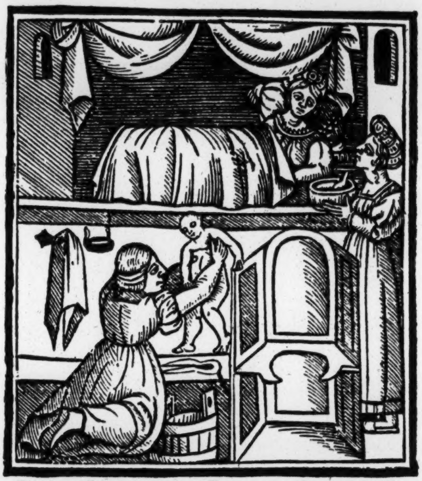
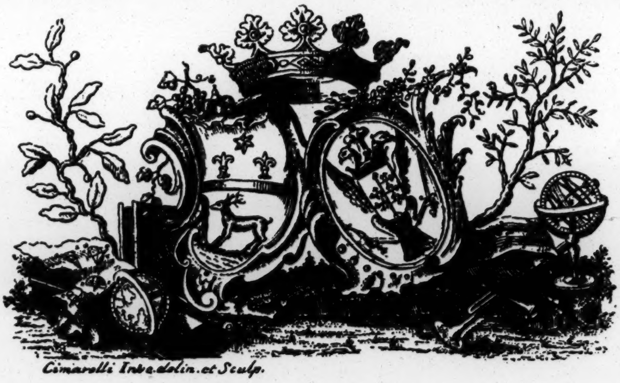


Fig. 37. Obstetrics in Eleventh Century. From Roeslin's "Del Parto de l'Huomo," 1538, and Probably from an Earlier MS, Showing Usual Birth-chair, Wooden Tub, Scissors, Lamp, Bed on Wall, and Difference in Costumes of Doctor and Nurse.

patients in a sick room or clinic or hospital. While monks were trying to cure some diseases by prayers and holy relics, practical women were able to bring comfort to the curable and incurable with hot compresses, soothing drinks, and anesthetic sponges. It was an old saying that where philosophy went out medicine came in to fill its place.

Hence it seems evident that from the beginning of history to the twelfth century there never was a century in which women were not treating their patients not only by the same methods as they were being treated by men doctors but also much more attentively and intelligently and effectively. Both men and women made a diagnosis in the same way,—by the appearance of the patient, by the pulse, and by the inspection of the urine. To them fever was regular or intermittent, and it needed no name. The patient died or was cured by more or less nauseating remedies taken with good faith. Certain symptoms were to be treated according to Galen, others according to the specific rules of the Church, but in any case we may infer that the women doctors were ready and willing to attend to the petty details of the sickroom with far more patience than is usually shown by men, and up to the end of the eleventh century, as we have seen, no man would have cared to take an obstetric case, even if asked, with its weary hours of waiting and watching, except at the occasional urgent call of a midwife who needed an extra pair of strong arms for a short time in an emergency.


Cimarelli Inv.e delin. et Sculp.

[Redi: Opere. Napoli, 1778.]

[From Schenckius: Observation um Medicarum, Francofurti, 1609.]

LARREY AND MEDIATE AUSCULTATION

In a rather extensive study of the beginnings of physical diagnosis, I do not recall anything bearing on the subject of Larrey and mediate auscultation. If there are other references, I think they should be published. I found the passages quoted hereafter in the course of a perusal of articles and books written in the first thirty or forty years of the nineteenth century, in the hope of learning contemporary impressions of the early days of percussion and auscultation.

The author, Johann Heinrich Kopp, was born in Hanau, Hesse-Nassau, September 17, 1777; studied in Marburg and Jena, and at the University of Jena took the M.D. degree in 1800. He settled in Hanau and soon became district physician, and also professor of chemistry, physics and *Naturgeschichte* in the local Lyceum, and gathered other positions, including the post of Physician to the Elector of Hesse, and the usual titles and decorations. He wrote much on various medical and medicolegal topics. His account of a medical tour in Germany and France in 1824 was published in 1825. From 1830 to 1845 he published "Denkwuerdigkeiten in der aerztlichen Praxis," four volumes.

The full title of the work from which I quote is: "Aerztliche Bemerkungen, veranlasst durch eine Reise in Deutschland und Frankreich im Fruehjahre und Sommer 1824. Von Dr. Johann Heinrich Kopp, kurfuerstlich hessischem Ober-Hofrathe, Medizinal-Referenten bei kurfuerstlicher Regierung zu Hanau und Garnisonarzte daselbst, inlaendischer und auswaertiger gelehrten Gesellschaften Mitgliede. Frankfurt am Main, Verlag der Hermannschen Buchhandlungen, 1825."

At the time he wrote, five years after the first edition of Laennec's work (De l'auscultation mediate, Paris, 1819), Kopp tells us that stethoscopes were sold by all cutlers in Paris, and in other shops near the École de Médecine. The price was two francs. The instruments came in two or three sections. Most physicians in Paris carried them in their pockets. Doctors of all opinions, such as Broussais, Recamier, etc., used them. Students carried them on rounds.

Kopp mentions as an exception that Larrey did not carry a stethoscope, but instead used a roll of paper which he applied to the chest of the patient. Kopp does not add that Laennec improvised his first stethoscope from a roll of paper but says that he saw the method used in Larrey's service in the Hospital of the Royal Guard, and that Larrey told him he had practiced it a long time, and long before the invention of the stethoscope. Kopp's further remarks indicate the novelty of auscultation:

> The use of the chest-tester [*Brustpruefer*] offers great difficulty at first, and

requires much practice. One must learn how to hear, just as the beginner in obstetrics, even when he knows the anatomy of the parts, has to learn the palpation of the pregnant and parturient woman. Laennec himself said that the differentiation of the fetal pulse is one of the most difficult things. Moreover, the stethoscope is frequently abused, and French physicians often think they hear more than they do, or the case presents.

Kopp tells how under the rule of the Bourbons the fame earned by Larrey in the Napoleonic campaigns suffered. It was the fashion to belittle his surgical ability and to emphasize his tendency to boast and to exaggerate his past exploits. A large part of his property shared the downfall of Napoleon, and the one hundred thousand francs the Emperor left him in his will was a small return for the contribution Larrey made in the final campaign. Kopp speaks highly of the kindness and humanity Larrey showed in his hospital service. Among various allusions to his military experiences he told Kopp the incident on the Island of Lobau, where with six thousand wounded he was cut off from all supplies. Without meat or kettles, Larrey had horses slaughtered, and the meat cooked in soldiers' cuirasses, seasoned with cannon powder. Kopp fails to add, but Larrey tells in his "Memoires" (t. III, 1812, p. 281), that the cooking removed the blackness of the powder and gave the bouillon its natural color.

George Dock, M.D.

NOTE

In printing the program of the American Association of Medical History the title of a paper which was read by Dr. David Riesman on the "Ancient Statutes of the University of Paris" was inadvertently omitted.

[Boyle: Opera omnia. Venetiis, 1697.]

BOOK REVIEWS

The Physician as Man of Letters, Science and Action. By Thomas Kirkpatrick Monro, m.d., Regius Professor of Medicine, University of Glasgow. Glasgow, Jackson, Wylie and Co., 1933.

This collection of brief biographies of physicians who have distinguished themselves in extra-professional walks of life is based on Dr. Monro's Presidential Address to the Royal Medico-Chirurgical Society of Glasgow in 1932. It is very catholic in character, including not only those who have won fame in art, literature, political, military and scientific avocations, but those who won notoriety as saints, criminals and pirates. In his Introduction Dr. Monro directs attention to previous attempts to list the members of our profession who have achieved fame in other lines. Both Sir Humphry Rolleston and Dr. Charles L. Dana, of New York, have written on physicians who have been poets also and Sir Archibald Garrod in his Harveian Oration in 1924 spoke of those who had contributed to science. Sir Humphry Rolleston referred to the work "De Medicis Poetis" published by Thomas Bartholinus in 1669, indicating how early the subject attracted attention.

Necessarily in a book of little more than two hundred pages Dr. Monro has omitted names which some of his readers will feel should have been included. Thus in the section, "Some American Medical Men," which includes fourteen biographies, no mention is made of Dr. Hugh Mercer, the distinguished soldier who achieved the rank of brigadier general and was killed in the battle of Princeton; or Dr. Benjamin Rush, probably the most famous medical man of the United States, who was a member of the Continental Congress and one of the Signers of the Declaration of Independence; of Dr. Thomas Holley Chivers, a once popular poet from whom Edgar Allen Poe is supposed to have derived important inspiration in versification, and Thomas Dunn English, the author of "Ben Bolt." Dr. Monro states that additional American names will be found in an article published in the *Lancet* in 1914, but we feel that those we have mentioned should have figured in his book in preference to some of those which are there. Despite this criticism Dr. Monro's work is on the whole very fair and impartial and includes most of the physicians who are worth recalling because of special distinction in other walks than medicine.

A good index, personal and general, adds much to the value of the book.

The Great Doctors, a Biographical History of Medicine. By Henry E. Sigerist, Professor of the History of Medicine, Johns Hopkins University. Translated by Eden and Cedar Paul. N. Y., W. W. Norton and Co., Inc., 1933.

In this attractively got up book Professor Sigerist avowedly bases the history of medicine from Imhotep and Aesculapius on a series of brief biographies of the great men whose achievements may be regarded as landmarks in the progress of medical science. It differs from other collections of medical biographies because the thread of historic perspective is never lost and the biographic aspect of the book is subordinated or dominated by the historic concept of the continuous development of medical science and thought of which the "Great Doctors" were only the exponents or exemplifiers. But a short time ago the reviewer received a request to name some book in which would be found the steps by which the great advances in medicine had been made. Of course they are recorded in all the general histories such as Neuburger, Castiglione and Garrison, but this book of Sigerist's seems to exactly supply the want expressed. Each biography gives full details of the particular achievement or reason which rendered its subject worthy of inclusion in a work of this character.

The book was first published in German in 1931, and the present edition is the second German and first in English. We believe as time goes on its popularity will increase. It is not a textbook or a work of reference but it is a most readable and reliable narrative of the main events of medical history from the earliest days to the present. Many excellent portraits accompany the text. The Author states that these are not added merely for ornamental purposes, because "A man's countenance, when we know how to look at it, will often tell us more than words."

A good brief bibliography and an excellent index enhance the book's value very materially.

OPUSCULA SELECTA NEERLANDICORUM DE ARTE MEDICA, VOLUMES IX, X AND XI. Nederlandsch Tijdschrift voor Geneeskunde Collegerunt et Ediderunt. Amsterdam, Sumptibus Societatis, 1930–32.

The service that the curators of the *Nederlandsch Tijdschrift voor Geneeskunde* are rendering to medical history in offering this series of Dutch medical classics with notes and translations is indeed hard to overestimate. Not only were many of these treasures originally published in forms now extremely difficult to obtain or even to have access to, but also the difficulties of the Latin or Dutch texts that were mostly used render them inaccessible to the majority of readers. The frequency with which English has been used as the medium for the translation is an especially fortunate circumstance for us. Reviews of the first 8 volumes, that have already appeared in this journal (1925, **7**, 312; 1928, **10**, 104; 1929, **1**, 362) outline the general scope of the project and indicate the efficient way in which it is being carried out.

Fasciculus Nonus: VEERTIEN TOT HEDENGEHEEL ONUITGEVEN BRIEVEN VAN ANTHONY VAN LEEUWENHOEK 1674–1678 (1930).

In the ninth volume, Leeuwenhoek's unpublished letters are presented, with the Dutch text to the left (as Leeuwenhoek presumably knew no language but his own [vide Letter 13a]), and an English translation by Dr. A. Querido on the right hand pages. As editions of Leeuwenhoek's works begin the letters with one designated No. 28, it had been assumed that the earlier letters had been lost. In 1922, however, Clifford Dobell, the distinguished British protozoologist who recently published "Antony von Leeuwenhoek and his 'Little Animals,'" found that all but two (Nos. 1 and 27) of the older 27 were intact in the Archives of the Royal Society of London to whom they had been addressed. He has not only tabulated these both in his book, and in this volume, but also has assisted in the preparation of the texts for the present volume and written an historical and bibliographical notice concerning them. As Dobell found that the contents of several are mainly included in other letters, only 14 are published here, in both Dutch and English texts. Leeuwenhoek's concern with microscopic "globules" runs through many of the letters, being noted in bile, broken up copper and lead, the optic nerve, erythrocytes and in the dried serum of the blood and many other materials that his unquenchable curiosity led him to study. In Letter 11, we find a curious apology for the poor quality of the salt illustrations that the Royal Society had apparently criticized. Was it a necessary precaution of the times or an excuse to protect the reputation of his beloved lenses that led him both to attribute the fault solely to his drawings, "om dat ick nict teijckenen" ("because I do not know how to draw") and to state "Mijn voornemen is de methode aen niemant bekent te maken!" ("my intention is to make the method known to nobody")?

Introductory remarks by van Rijnberk and van Leersum and a section by de Lint on Portraits of Leeuwenhoek together with 15 full-page illustrations give a welcome background to the letter-text. One cannot but regret the absence of an index, especially as many of the letters cover a wide variety of subjects.

Fasciculus Decimus: BONTIUS TROPISCHE GENEESKUNDE (1931).

The tenth volume is devoted entirely to James Bontius (de Bondt) (1592–1631) and his noted book on Tropical Medicine, "De Medicina Indorum." Educated at Leyden University, where his father was Professor of Medicine, Bontius after practicing at Leyden, was appointed physician to the East India Company and sailed in 1627 with his wife and two little children in the convoy that carried the Governor General Coen. As usual, scurvy developed on the voyage, of which disease his wife may have been one of the victims. Arriving at Batavia, he soon married again, only to be stricken with dysentery together with his wife and both children. Soon he almost died of beri-beri, his wife died of cholera and his eldest son of smallpox. Nothing daunted, he married again, this third time the widow of the clergyman who had died of dysentery. Shortly after his patron, Coen, died of the same disease. Such was the background for the observations on which his great book was based; shortly after he succumbed himself, at the early age of forty, presumably to a similar infection. Though he carefully studied previous writers on oriental diseases (the first of his six books being Animadversions on Garcias ab Orta's book on Indian Plants), yet he believed "that the evidence of one ocular witness is superior to the testimony of ten persons, who relate their facts from auricular information." Believing also that each country contained within its boundaries herbs capable of curing the diseases that it was subject to, he carefully studied and described the medicinal herbs of Java and the neighboring islands that he had access to.

His greatest discovery, that of beri-beri, is described in the first chapter of Book III, "Of a particular kind of palsy, called the Barbiers." Though the word is now thought to be derived from the Singhalese, "I cannot" (on account of the great weakness that is characteristic of the condition), Bontius traced its derivation from "sheep" on account of the supposedly sheep-like gait. Making allowance for the expected humoral explanation of the disease, we find an excellent though brief description—in eleven lines. The lassitude, parenthesias, speech disturbances and so on make the condition easy to recognize, though the resolution of the cold and viscid humour is accomplished with difficulty. Edema is not included by Bontius. Exercise, external fomentations, attenuation of the humors with decoctions of china root, sarsaparilla and guaiac, purges and Theriaca and Mithridate, "to promote sweat and urine and strengthen the nerves," are the remedies suggested. Bleeding is to be avoided and diet is not considered, though in the case of the Moluccan blindness he attributes the cause to eating warm rice, and recommends a better diet together with raw shark's liver. A closer approach to the vitamins was to wait 250 years for Eijkman's studies, also in Java. Also as van Andel points out in the Introduction, Pieter Both, the first Governor General in 1611, had written of "a plague named beri-beri, which causes the sufferers to become totally impotent in legs and hands."

Other noteworthy descriptions are to be found in Book III, especially the devastating dysentery, "an ulceration of the intestines with a perpetual purging, at first mucous, afterwards bloody, and lastly purulent, intermixed with the very substance of the bowels, with intolerable pain and griping of the belly." Here he includes the Hepatic Flux, and the dread Tenesmus (rectal ulceration), while for abscess of the liver surgical treatment is recommended. The Amboyna smallpox (frambesia?) is distinguished from syphilis, while the relation of Bontius' "cholera" to true Asiatic cholera remains obscure. In Book IV, we find twelve "observations taken from the dissection of dead bodies," an especially meritorious activity when one considers the conditions under which he worked.

Book II is apparently intended as a popular disquisition, in dialogue form, on the Conservation of Health. A good half of the book is occupied by the last two books on the fauna and flora of the region. The Ourang Outang or Woodman, the Satyr of Pliny, is familiar to us through the illustration, as is the picture of the Dodo to lovers of Alice in Wonderland.

The bibliography of this work is interesting and complex. First published by Hackius of Leyden as a small duodecimo in 1642, eleven years after the author's death, it reappears in part in 1645 and again in 1646, 1714 and 1745, appended to Alpinus' "Medicina Aegyptorum." Perhaps its best known edition is from the famous Elzevir press (1658) combined with Willem Piso's "Historia Naturalis Brazileae" to form the beautiful folio, "De Indias utriusque res naturales et medicae." In addition to two Dutch versions, an English translation by Noteman of the first four books in the year 1769. It is this version that has been followed in the present work, the last two books being specially translated from the Elzevir Piso by Dr. A. Querido.

Fasciculus Undecimus: UIT DE GESCHIEDENIS VAN HET VITALISME (1932).

This, the latest to appear of the Opuscula series, combines under the unifying banner of Dutch vitalism such apparently disconnected works as van Helmont on the Archaeus, Gaubius on the Healing Effect of the Soul and Schroeder van der Kolk on the Difference between Inanimate and Living Forces and the Soul. Van Helmont's two chapters from his Ortus Medicinae "Archaeus Faber, Spiritus Vitae" (pp. 45–88) and Gaubius' "De Regimine Mentis" (pp. 89–282) appear in Latin and German; van der Kolk's "Over het verschil tusschen doode natuurkrachten, levenskrachten en ziel" (pp. 283–358) in Dutch and German. Particularly appropriate is the appearance of such a volume as this at a time when vitalism, the belief in the specific nature of life, has again raised its head above the materialistic onslaughts of the past generation.

In deFeyfer's interesting Introduction (in German), the persistent idea of vitalism is traced from the Iliad through Aristotle and Hippocrates, past Galen to Thomas Aquinas and Albertus Magnus. Their authority carried it to the times of Paracelsus' Conservator, v. Helmont's Archaeus (Internal Task master) and of Stahl's Animism (here regarded as a reaction to Boerhaave's mechanism). Van Helmont maintained that bodily functions are each activated by a special "Gas" (a word of his own invention), which is governed by a special "Blas." These in turn were presided over by a central "anima sensitiva motivaque."

Though Bordeu and Barthez are usually credited with the more modern establishment of vitalism through Montpeller, Feyfer maintains that Gaubius, Boerhaave's successor at Leyden, was the one responsible for its spread through 18th century Europe. In his "Institutiones Pathologiae Medicinalis" (1758) Gaubius describes his "Enormon, or stimulating principle, which arising from the soul, constitutes the most important part of the living body, and might perhaps even be called life itself." Of special interest to pathologists, Gaubius exercised great influence over medical thought and his textbook, translated into French and German, was used in most of the European universities. As recently elaborated in Neuburger's book on "The Doctrine of the Healing Power of Nature throughout the Course of Time," Gaubius, while skillfully accomodating the known mechanistic evidence of his time, emphasized nature as the healer of disease: "For medicine as understood today is the knowledge and skillful guidance of the powers of human nature and of the natural resources for protecting life and health from disease and death. It is the action of the soul (Cp. van Helmont's Archaeus, Stahl's Anima, Driesch's Neo Vitalism) that leads to health (p. 101)." Vitalism, thus coming anew from the Netherlands as well as from France continued to spread through Europe. Even DuBois Reymond, a decided mechanist, recognized that the living force occupied the wings of the stage of life in a mysterious, supersensory (übersinnliche) manner (p. 37). It was different from all physical and chemical forces and not revealable by physical and chemical methods. But the trend was already in the direction of mechanistic explanations of biological phenomena. With Wöhler's synthesis of urea in 1836, the borders of the inorganic and organic worlds were obliterated and his discovery was hailed by the materialists as the beginning of a complete explanation of vital phenomena. His celebrated letter to Berzelius ("denn ich kann, sozusagen, mein chemisches Wasser nicht halten und muss Ihnen sagen, dass ich Harnstoff machen kann, ohne dazu Nieren oder überhaupt ein Thier, sey es Mench oder Hund, nöthig zu haben,") appeared several years before van der Kolk's treatise "Over het verschil tusschen doode natuurkrachten, levenskrachten en ziel" ("On the Difference between the Inanimate Forces of Nature, the Life Force and the Soul") (Utrecht, 1835). Based on a lecture to a mixed audience, admittedly to combat the growing audacity (onbeschaamdheid) of materialism, the author here emphasizes the differences between the physiology of nerve conduction and the physics of electricity. The brain by no means bears the same relation to the soul as, for instance, does the stomach to digestion; in other words an invisible force, an X, always remains unexplained. Portraits and title pages add to the production, but again we miss an index.

E. B. Krumbhaar

[Remarques de M. Winslow. Paris, 1755.]

INDEX

Adelmann, Howard B.: "De ovorum gallinaceorum generationis primo exordio," of Volcher Coiter, 327, 444
American Association of the History of Medicine, ninth annual meeting, editorial, 406
Anatomy, teaching history of, editorial, 505
Anderson, William, by J. J. Keevil, 511
Anesthesia, local, earliest suggestion of the use of cocaine for, by W. F. von Oettingen, 275
Arabian medicine, reflection of, at Salerno and Montpellier, by Lutfi M. Sa'di, 215
as represented in the memoirs of Usāmah Ibn-Munqidh, by Dana C. Munro and Cushman D. Haagensen, 226
Auscultation, mediate, Larrey and, editorial, by George Dock, 601

Baumgartner, Leona, and Ramsey, Elizabeth M.: Johann Peter Frank and His "System einer vollständigen medicinischen Polizey," 525
Beaumont, William, by William Snow Miller, 28
Beeson, B. Barker: Pierre Joseph Desault, 342
Bibliography of the Honorable Robert Boyle, by J. F. Fulton, review of, 101
Bilikiewicz, Tadeusz: Embryologie im Zeitalter des Barock und des Rokoko, review of, by David Riesman, 312
Biographisches Lexikon der hervorragenden Ärzte aller Zeiten und Völker, by W. Haberling, H. Vierardt and Prof. Hübotter, review of, 204
d. letzen 50 Jahre, by I. Fischer, review of, by David Riesman, 102, 311
Blanton, Wyndham B.: Washington's medical knowledge and its sources, 52
Book of delight, by Joseph ben Mèïr ibn Zabara, review of, 311
of Manchester and Salford, review of, 314
Book Reviews:
Antony von Leeuwenhoek and his "little animals," by Clifford Dobell, 202
Aus der Medizin des Rinascimento, by Paul Strassmann, reviewed by David Riesman, 202
Bibliography of the Honorable Robert Boyle, by J. F. Fulton, 101

Book Reviews:
Biographisches Lexikon der hervorragenden Ärzte aller Zeiten und Völker, by W. Haberling, H. Vierardt and Prof. Hübotter, 204
d. letzen 50 Jahre, by I. Fischer, reviewed by David Riesman, 102, 311
Book of delight, by Joseph ben Mèïr ibn Zabara, 311
of Manchester and Salford, 314
Catalogus van de Bibliotheek der Nederlandsche Maatschappij tot Bevordering der Geneeskunst, 509
Chapters in American obstetrics, by Herbert Thoms, 314
Embryologie im Zeitalter des Barock und des Rokoko, by Tadeusz Bilikiewicz, reviewed by David Riesman, 312
Gedanken eines Arztes über Seele, Natur und Gott, by F. P. Weber, 509
Great doctors, a biographical history of medicine, by Henry E. Sigerist, 603
Heroic age of science, by W. A. Heidel, 507
History of dermatology, by W. A. Pusey, 313
and epidemiology of syphilis, by W. A. Pusey, 510
of urology, by American Urological Association, 506
Kongress für innere Medizin, by Georg Klemperer, reviewed by David Riesman, 102
Manuscripta medica, by Warren R. Dawson, 204
Medicine in Canada, by William B. Howell, 407
Memoirs of Sir Robert Sibbald, by Francis Paget Hart, 407
Nutrition, by Graham Lusk, 506
Opuscula selecta neerlandicorum de arte medica, vols. IX, X and XI, 604
Pharmazeutsiche Altertumskunde und die Schweizerische Apothekerwesen an der Universität Basel, by Joseph Anton Häfliger, reviewed by David Riesman, 312
Physician as man of letters, science and action, by Thomas K. Monro, 603

BOOK REVIEWS:
  Roundabout Harley Street, the story of some famous streets, by Cyril Phillips Bryan, 311
  Überlieferung der Hippocratischen Schrift ΠΕΡΙ ΑΕΡΩΝ ΥΔΑΤΩΝΤΟΠΩΝ, by Hans Diller, 408
Bowditch, Henry Ingersoll, by Adolph A. Walkling, 428
Brunschwig, Alexander: Jean Fréderic Lobstein, 82
Bryan, Cyril Phillips: Roundabout Harley Street, review of, 311
Bryan, Joseph Hammond: History of laryngology and rhinology and the influence of America in the development of this specialty, 151
Butler, C. S.: Doctor as diplomat, editorial, 306

Catalogus van de Bibliotheek der Nederlandsche Maatschappij tot Bevordering der Geneeskunst, review of, 509
Chance, Burton: Goethe and his theory of colors, 360
Chapters on American obstetrics, by Herbert Thoms, review of, 314
Chaucer, why I read, at seventy, by James B. Herrick, 62
Cocaine, earliest suggestion of the use of, for local anesthesia, by W. F. von Oettingen, 275
Coiter, Volcher, "De ovorum gallinaceorum generationis primo exordio," by Howard B. Adelmann, 327, 444
Colors, Goethe and his theory of, by Burton Chance, 360

Dawson, Warren R.: Manuscripta medica, review of, 204
"De ovorum gallinaceorum generationis primo exordio," of Volcher Coiter, by Howard B. Adelmann, 327, 444
Denninger, Henri Stearns: Paleopathological evidence of Paget's disease, 73
Desault, Pierre Joseph, by B. Barker Beeson, 342
Diller, Hans: Überlieferung der Hippocratischen Schrift ΠΕΡΙ ΑΕΡΩΝ ΥΔΑΤΩΝΤΟΠΩΝ, review of, by David Riesman, 408
Dobell, Clifford: Antony von Leeuwenhoek and his "little animals," review of, 202
Dock, George: Larrey and mediate auscultation, editorial, 601
Doctor as diplomat, editorial, by C. S. Butler, 306

EDITORIALS:
  Doctor as diplomat, by C. S. Butler, 306
  Larrey and mediate auscultation, by George Dock, 601
  Luesiana in the library of the College of Physicians of Philadelphia, by E. B. Krumbhaar and E. V. Garner, 96
  Most interesting newspaper in the United States, by David Riesman, 197
  Ninth annual meeting of the American Association of the History of Medicine, 406
  Teaching history of anatomy, 505
Embryologie im Zeitalter des Barock und des Rokoko, by Tadeusz Bilikiewicz, review of, by David Riesman, 312
Epidemics, influenza, history of, by John F. Townsend, 533

Fischer, I.: Biographisches Lexikon der hervorragenden Ärzte d. letzen 50 Jahre, review of, by David Riesman, 102, 311
Frank, Johann Peter, and his "System einer vollständigen medicinischen Polizey," by Leona Baumgartner and Elizabeth M. Ramsey, 525
Fulton, J. F.: Bibliography of the Honorable Robert Boyle, review of, 101

Garner, V. C., and Krumbhaar, E. B.: Luesiana in the library of the College of Physicians of Philadelphia, editorial, 96
Gedanken eines Arztes uber Seele, Natur und Gott, by F. Parkes Weber, review of, 509
Gibson, Thomas: Account of Theodore Turquet de Mayerne's "Praxis medica," 438
  Sketch of career of Theodore Turquet de Mayerne, 315
Goethe and his theory of colors, by Burton Chance, 360
Goodfellow, George E., frontier surgeon and soldier, by Miley B. Wesson, 236
Graefenberg, Shepard family's medical school, by Roy H. Turner, 548
Great doctors, a biographical history of medicine, by Henry E. Sigerist, review of, 603
Guillotin's idea, by James Hendrie Lloyd, 120

Haagensen, Cushman D., and Munro, Dana C.: Arabian Medicine as represented in the memoirs of Usāmah Ibn-Munqidh, 226
Haberling, W., Vierardt, H., and Prof. Hübotter: Biographisches Lexikon der hervorragenden Ärzte aller Zeiten und Völker, review of, 204
Häfliger, Joseph Anton: Pharmakeutische Altertumskunde und die Schweizerische Sammlung für historisches Apothekerwesen an der Universität Basel, review of, by David Riesman, 312
Harrison, Forrest M.: Psychiatry in historical retrospect, 85
Hart, Francis Paget: Memoirs of Sir Robert Sibbald, review of, 407
Heberdens, the two, by Sir Humphry Rolleston, 409, 566
Heidel, William A.: Heroic age of science, review of, 507
Heroic age of science, by William A. Heidel, review of, 507
Herrick, James B.: Why I read Chaucer at seventy, 62
History of dermatology, by W. A. Pusey, review of, 313
  of purpura hemorrhagica, by Howard W. Jones and Leandro M. Tocantins, 349
  of women in medicine, by Kate Campbell Hurd-Mead, 1, 171, 281, 390, 484, 584
Howell, William B.: Medicine in Canada, review of, 407
Hübotter, Prof., Haberling, W., and Vierardt, H.: Biographisches Lexikon der hervorragenden Ärzte aller Zeiten und Völker, review of, 204
Hurd-Mead, Kate C.: Introduction to the history of women in medicine, 1, 171, 281, 390, 484, 584

Influenza epidemics, history of, by John F. Townsend, 533
Intolerance of great men, by David B. Radner, 561

Jackson, Dr. Hall, of Portsmouth, by Russell Leigh Jackson, 103
Jackson, Russell Leigh: Dr. Hall Jackson of Portsmouth, 103
Jones, Howard W. and Tocantins, Leandro M.: History of purpura hemorrhagica, 349

Keevil, J. J.: William Anderson, 511

Klemperer, George: Kongress für innere Medizin, review of, by David Riesman, 102
Kongress für innere Medizin, by Georg Klemperer, review of, by David Riesman, 102
Krumbhaar, E. B.: review of Opuscula selecta neerlandicorum de arte medica, vols. IX, X and XI, 604
  and Garner, V. C.: Luesiana in the library of the College of Physicians of Philadelphia, editorial, 96

Larrey and mediate auscultation, editorial, by George Dock, 601
Laryngology and rhinology, history of, and the influence of America in the development of this specialty, by Joseph Hammond Bryan, 151
von Leeuwenhoek, Antony, and his "little animals," by Clifford Dobell, review of, 202
Lloyd, James Hendrie: Dr. Guillotin's idea, 120
Lobstein, Jean Frédéric, by Alexander Brunschwig, 82
Luesiana in the library of the College of Physicians of Philadelphia, by E. B. Krumbhaar and E. V. Garner, editorial, 96
Lusk, Graham: Nutrition, review of, 506

Manuscripta medica, by Warren R. Dawson, review of, 204
de Mayerne, Theodore Turquet, account of his "Praxis medica," by Thomas Gibson, 438
  sketch of career of, by Thomas Gibson, 315
Medicine in Canada, by William B. Howell, review of, 407
  introduction to history of women in, by Kate Campbell Hurd-Mead, 1, 171, 281, 390, 484, 584
  in Philadelphia in the 18th century, practice of, by Francis R. Packard, 135
Medizin des Rinascimento, aus der, by Paul Strassmann, review of, by David Riesman, 202
Memoirs of Sir Robert Sibbald, by Francis Paget Hart, review of, 407
Miller, William Snow: William Beaumont, 28
Monro, Thomas K.: Physician as man of letters, science and action, review of, 603
Montpellier and Salerno, reflection of Arabian medicine at, by Lutfi M. Sa'di, 215

Munro, Dana and Haagensen, Cushman D.: Arabian medicine as reflected in the memoirs of Usāmah Ibn-Munqidh, 226

Newspaper, most interesting, in the United States, by David Riesman, editorial, 197
Nutrition, by Graham Lusk, review of, 506

von Oettingen, W. F.: Earliest suggestion of use of cocaine for local anesthesia, 275
Opuscula selecta neerlandicorum de arte medica, vols. IX, X and XI, review of, by E. B. Krumbhaar, 604

Packard, Francis R.: Practice of medicine in Philadelphia in the 18th century, 135
Paget's disease, paleopathological evidence of, by Henri Stearns Denninger, 73
Paleopathological evidence of Paget's disease, by Henri Stearns Denninger, 73
Parker, Willard, by John Ruhräh, 205, 376, 458
Pharmakeutische Altertumskunde und die Schweizerische Sammlung für historisches Apothekerwesen an der Universität Basel, by Joseph A. Häfliger, review of, by David Riesman, 312
Physician as man of letters, science and action, by Thomas K. Monro, review of, 603
"Praxis medica," Theodore Turquet de Mayerne's, account of, by Thomas Gibson, 438
Psychiatry in historical retrospect, by Forrest M. Harrison, 85
Purpura hemorrhagica, history of, by Howard W. Jones and Leandro M. Tocantins, 349
Pusey, W. A.: History of dermatology, review of, 313
    and epidemiology of syphilis, review of, 510

Radner, David B.: Intolerance of great men, 561
Ramsey, Elizabeth M., and Baumgartner, Leona: Johann Peter Frank and his "System einer vollständigen medicinischen Polizey," 525
Riesman, David: Most interesting newspaper in the United States, editorial, 197
    review of Aus der Medizin des Rinascimento, by Paul Strassmann, 202
    of Biographisches Lexikon der hervorragenden Ärzte d. letzen 50 Jahre, by I. Fischer, 102, 311
    review of Embryologie im Zeitalter des Barock und des Rokoko, by Tadeusz Bilikiewicz, 312
    of Kongress für innere Medizin, by Georg Klemperer, 102
    of Pharmazeutische Altertumskunde und die Schweizerische Sammlung für historisches Apothekerwesen an der Universität Basel, by Joseph A. Häfliger, 312
    of Überlieferung der Hippocratischen Schrift ΠΕΡΙ ΑΕΡΩΝ ΥΔΑΤΩΝΤΟΠΩΝ, by Hans Diller, 408
Rolleston, Sir Humphry: The two Heberdens, 409, 566
Roundabout Harley Street, by Cyril P. Bryan, review of, 311
Ruhräh, John: Willard Parker, 205, 376, 458

Sa'di, Lutfi M.: Reflection of Arabian medicine at Salerno and Montpellier, 215
Salerno and Montpellier, reflection of Arabian medicine at, by Lutfi M. Sa'di, 215
Shaw, Manley Bradford: Short history of the sweating sickness, 246
Shepard family's medical school, Graefenberg, by Roy H. Turner, 548
Sigerist, Henry E.: Great doctors, a biographical history of medicine, review of, 603
Strassmann, Paul: Aus der Medizin des Rinascimento, review of, by David Riesman, 202
Sweating sickness, short history of the, by Manley Bradford Shaw, 246
Syphilis, history and epidemiology of, by W. A. Pusey, review of, 510

Teaching history of anatomy, editorial, 505

Thoms, Herbert: Chapters on American obstetrics, review of, 314
Tocantins, Leandro M. and Jones, Howard W.: History of purpura hemorrhagica, 349
Townsend, John F.: History of influenza epidemics, 533
Turner, Roy H.: Graefenberg, Shepard family's medical school, 548

Überlieferung der Hippocratischen Schrift ΠΕΡΙ ΑΕΡΩΝ ΥΔΑΤΩΝΤΟΠΩΝ, by Hans Diller, review of, by David Riesman, 408
Urology, history of, review of, 506
Usāmah Ibn-Munqidh, Arabian medicine as represented in the memoirs of, by Dana C. Munro and Cushman D. Haagensen, 226

Vierardt, H., Haberling, W., and Prof. Hübotter: Biographisches Lexikon der hervorragenden Arzte aller Zeiten und Völker, review of, 204

Walkling, Adolph A.: Henry Ingersoll Bowditch, 428

Washington's medical knowledge and its sources, by Wyndham B. Blanton, 52

Weber, F. Parkes: Gedanken eines Arztes uber Seele, Natur, und Gott, review of, 509

Wesson, Miley B.: George E. Goodfellow, frontier surgeon and soldier, 236

Women in medicine, introduction to the history of, by Kate C. Hurd-Mead, 1, 171, 281, 390, 484, 584

Zabara, Joseph ben Mèïr ibn: Book of delight, review of, 311

Cum INDICE locupletiſsimo.

[Franciscus Vallesius: Hippocrates. Coloniae, 1589.]